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SUPPLEMENTAL DATA TO PHOTOFACT FOLDER 10 IN SET 235

RCA VICTOR MODELS 27D331, U (Ch. KCS77A, B)

RCA Victor models 27D382, U, 27D383, U, and 27D384, U (Ch. KCS77C, D, F, H) were covered in Photofact Folder 10 — Set 235.

Models 27D331 and 27D331U (Ch. KCS77A, B) are electrically identical except for the following changes.

L32, 5th. video IF coil is changed to part #76436.

Model 27D331 incorporates tuner KRK22A. A schematic of this tuner is given in Fig. 1. Alignment procedure is given later in this bulletin.

Model 27D331U incorporates tuner KRK12. A schematic of this tuner is given in Fig. 2. Alignment procedure is given later in this bulletin.

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

The high voltage shock hazard can be eliminated by removing the horizontal oscillator tube, V19.

The antenna matching unit is properly aligned at the factory. The RF unit is aligned with a particular antenna matching unit in place. If a new antenna unit is installed, the RF unit should be realigned. Alignment should not be attempted without the proper alignment facilities.
Disconnect the lead from the FM trap, L7, to the channel selector switch.
Use a short jumper to connect point (A) on the matching unit thru a .001MFD capacitor to pin 1 (grid) of 6CB6 (V4).
Remove 6CB6 (V3) from its socket.
Cover of the matching unit must be in place during alignment.
Connect the ends of a 1000Ω potentiometer across a 7.5 volt battery capable of withstanding considerable current drain.
Connect the positive terminal to chassis and the potentiometer arm to the junction of R24, R68 and R69.
Set the potentiometer arm to obtain -5 volts at this point.
Connect the synchronized sweep voltage from the sweep generator to the horizontal input of the oscilloscope for horizontal deflection.
The sweep generator output lead should be terminated with its characteristic impedance, usually 50 ohms.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
1.	Two 130Ω Carbon Resistors	Across antenna terminals with 130Ω in each lead.	Not used	45.75MC (400∿Mod)	Any	Vert. Amp. to point (B). Low side to chassis.	A1	Set oscilloscope gain to maximum and adjust A1 for MINIMUM 400∿ response.
2.	"	"	"	41.25MC (400∿Mod)	"	"	A2	Adjust for MINIMUM 400∿ response on scope.
3.	"	"	50MC (10MC Swp)	50MC 52MC 53MC	"	Vert. Amp. thru detector (Fig. 1) to point (A). Low side to chassis.	A3, A4	Remove the .001MFD capacitor (See instructions above) from point (A) and connect a 300Ω carbon resistor from point (A) to chassis using short leads. Adjust A3 and A4 to obtain response curve as in Fig. 2. Repeat steps 1, 2 and 3 until no further improvement is made. Remove the 300Ω resistor and the detector probe. Restore the connection between L7 and the channel switch. Replace V3.

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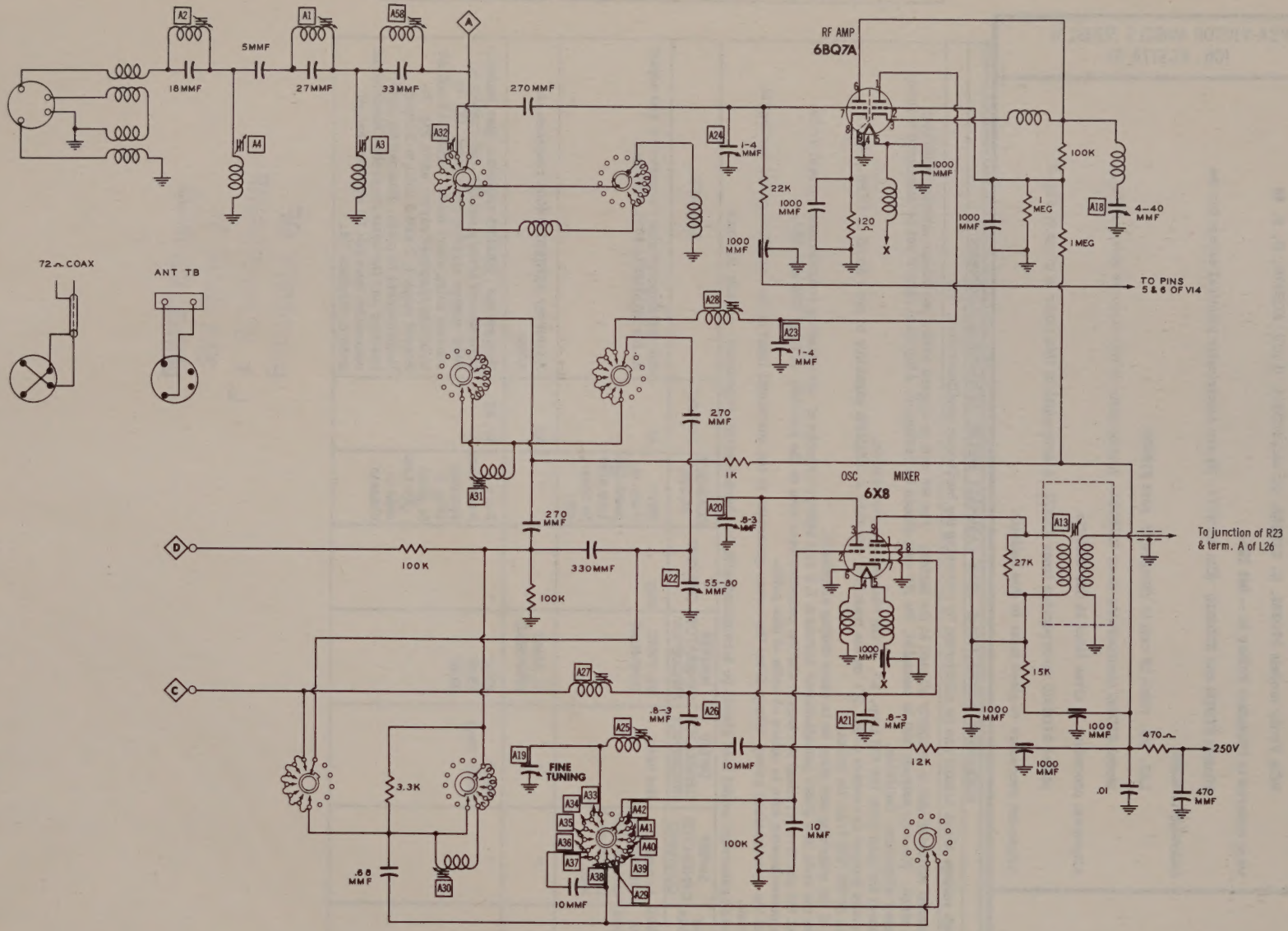
RF AMP
6BQ7A
OSC MIXER
6X8
72Ω COAX
ANT TB
A2
A1
A58
A
5MMF
18MMF
27MMF
33MMF
270MMF
A4
A3
A32
A24
1-4 MMF
22K
1000 MMF
120Ω
X
100K
1 MEG
A18
4-40 MMF
TO PINS 5 & 6 OF V14
A28
A23
1-4 MMF
270 MMF
1K
A31
D
100K
330MMF
A22
55-80 MMF
A20
.8-3 MMF
A13
To junction of R23 & term. A of L26
27K
C
A27
A26
A25
A21
15K
A19
FINE TUNING
10MMF
12K
470Ω
250V
.01
470 MMF
3.3K
.68 MMF
A30
A33
A34
A35
A36
A37
A38
A42
A41
A40
A39
A29
100K
.10 MMF

FIG. 1

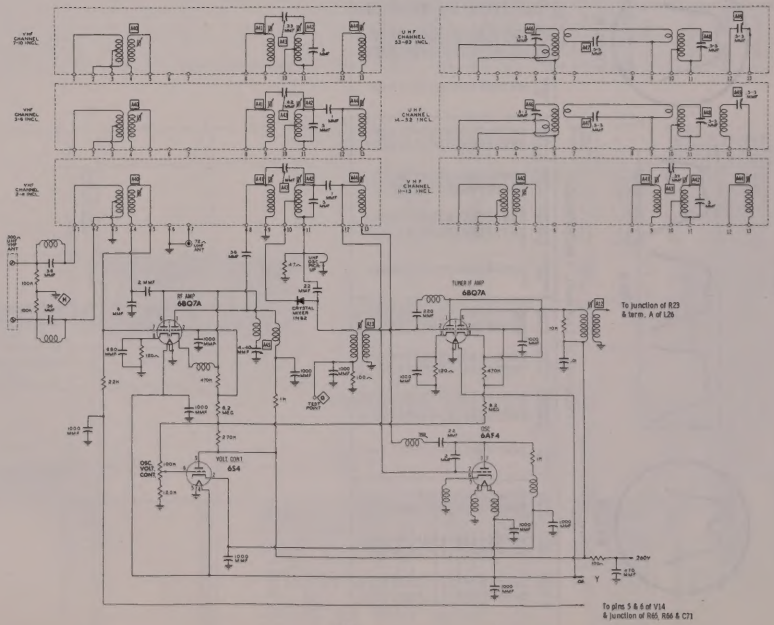
VHF CHANNEL 7-13 INCL.
VHF CHANNEL 2-6 INCL.
VHF CHANNEL 2-6 INCL.
UHF CHANNEL 53-83 INCL.
UHF CHANNEL 14-52 INCL.
UHF CHANNEL 11-13 INCL.
RF AMP 6BQ7A
CRYSTAL MIXER 1N82
TUNER IF AMP 6BQ7A
6AF4
OSC VOLT CONT
VOLT CONT 6S4
To junction of R23 & term. A of L26
To pins 5 & 6 of V14 & junction of R65, R66 & C71

FIG. 2

KRK12 TUNER VHF ALIGNMENT

It is necessary to meter the non-oscillating plate current of the 6S4 voltage control tube. This can be accomplished by use of an adaptor or similar arrangement. The circuit diagram is shown in Fig. 3.
Remove 6S4 from its socket and insert the adaptor plug. Plug 6S4 into adaptor.
Connect 0-50MA meter to adaptor and turn the switch on.
Remove the tuner cover shield.
Set channel selector midway between channels to disable local oscillator. Some tubes may oscillate even with the tuned circuits disengaged.
As a check, short circuit the spring contacts 12 and 13, nearest the tuner front, with a finger. (Contacts are at zero DC potential).
If plate current rises keep finger on contacts while adjusting the oscillator voltage control for 38MA indication on meter.
Replace tuner cover shield.
The oscilloscope used should have sensitivity of 1 milli watt per inch. If sensitivity is less a suitable preamplifier may be used with the scope.
A heterodyne frequency meter is used while making VHF oscillator adjustments.
To find oscillator frequency for any UHF or VHF channel add 45.75MC to the picture carrier frequency for that channel as listed in the frequency chart.
Connect the synchronized sweep voltage from the sweep generator to the horizontal input of the oscilloscope for horizontal deflection.
The sweep generator output lead should be terminated with its characteristic impedance, usually 50 ohms.
Set the fine tuning control to the mid-position of its range.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
4.	None	Couple loosely to antenna terminals.	Set sweep to cover channel being aligned. See channel frequency chart	Set alternately to video and sound carrier frequency of channel being aligned see chart	2 thru 13	Vert. Amp. to point (C). Low side to chassis.	A40, A41, A42, A43 See Remarks	Ground the AGC line at tuner terminal board. Turn off the adaptor switch, removing plate voltage from oscillator Adjust for response similar to Fig. 4. Each channel strip adjustment for an individual channel strip has a corresponding adjustment on all other VHF channel strips. Since these adjustments are identical in position and function they are indicated by the same "A" number in the interests of simplification. Adjustments A40, A41 and A42 for each channel strip are accessible thru holes in top of tuner as the channel switch is turned to each channel. Adjustment A43 refers to coupling capacitor whose positioning affects bandwidth of response curve.
5.	Remove the ground placed on AGC line in above step. Turn the AGC control fully clockwise. Connect the potentiometer arm of the bias supply to the tuner AGC terminal. Connect the positive lead to the tuner case. Adjust for -5 volts at AGC terminal. Connect the potentiometer arm of a second bias supply to the junction of R34, R68 and R69 and the positive lead to chassis. Adjust for -5 volts at potentiometer arm. Turn the 6S4 adaptor switch on to apply plate voltage to the oscillator. Connection of the heterodyne frequency meter for oscillator adjustment is made as follows: Insert the end of an insulated piece of wire into either of two holes next to the oscillator tube at the right top corner of the tuner. Use care so that wire does not touch any tuned circuits. Connect the other end of wire to RF input of the frequency meter.							
6.		Connect frequency meter as above.	Not used	Freq. meter to 257MC	13	Not used.	A44	Adjust for audible beat on frequency meter.
7.	Two 130Ω Carbon Resistors	Across antenna terminals with 130Ω in each lead.	213MC (10MC Swp)	211.25MC	13	Vert. Amp. to point (B). Low side to chassis.		Adjust A13 for maximum gain on scope. Adjust A43 for maximum gain and flat-topped curve. Recheck A13 for maximum gain at center of band.
8.		Connect frequency meter as in step 35.	Not used	Freq. meter to oscillator frequency, channels 12 thru 2 See chart.	12 thru 2	Not used	A44, A45	Adjust A44 on each channel for audible beat on frequency meter. Connect sweep generator and scope as in step 37, set sweep and marker to proper frequencies for each channel and adjust A42, if necessary, for maximum gaindand proper response curve.
9.	Direct	High side to point (H). Low side to chassis.	Not used	43.5MC (400%Mod)	Any	Vert. Amp. to point (B). Low side to chassis.	A45	Adjust for MINIMUM 400% indication on scope.

KRK12 TUNER UHF ALIGNMENT

Alignment of the UHF portion of the tuner should not be attempted unless the following test equipment is available, in addition to the usual VHF test equipment: A UHF sweep generator covering the frequency range of 470MC to 890MC.
A marker generator of crystal accuracy covering the same frequency range.
Leave 6S4 adaptor connected as under KRK12 Tuner VHF Alignment.
Connect the synchronized sweep voltage from the signal generator to the horizontal input of the oscilloscope for horizontal deflection.
The sweep generator output lead should be terminated with its characteristic impedance, usually 50 ohms.
Set the fine tuning control to the mid-position of its range.

10.	10 db Attenuator Pad	Sweep generator thru attenuator to antenna terminals. Couple UHF marker generator loosely to antenna terminals.	Set sweep to cover channel being aligned. See chart. Use 10MC sweep width	Set alternately to video and sound carrier frequency of channel being aligned. See chart.	14 thru 83	Vert. Amp. to point (G). Low side to chassis.	A46, A47, A48	Turn off the adaptor switch, removing plate voltage from oscillator. Ground the AGC line at the tuner terminal board. Adjust for maximum gain, symmetrical response curve centered about the pass band. See Fig. 5 for acceptable variations.
11.	Connect both bias supplies and adjust as under Tuner VHF Alignment. Remove the ground from the AGC line. Turn the adaptor switch on to apply plate voltage to the oscillator. Connect the VHF signal generator to point (J) using very short leads. Set generator to 45.75MC for remainder of tuner alignment.							
12.	10 db Attenuator Pad	Sweep generator thru attenuator to antenna terminals. Connect UHF marker generator to point (G) and tuner chassis.	Set sweep to cover channel being aligned. See chart. Use 10MC sweep width.	Set to video carrier frequency of channel being aligned. See chart.	14 thru 83	Vert. Amp. to point (G). Low side to chassis.	A48	Adjust A48 for channel strip being aligned until 45.75MC and video carrier marker coincide on response curve. Adjust A48 of channel strip being aligned for maximum gain with proper waveshape. Connect VTVM to point (G). Common to chassis. Set oscillator injection adjustment for reading on VTVM between .1 volt and .3 volt on all channel strips.

FM TRAP ADJUSTMENT

Tune in a TV station on which FM interference is noted and adjust A58 to minimize the interference. On some receivers A58 will tune into channels 6 or 5. Care must be used to avoid this possibility as reduced sensitivity on these channels will result.

KRK32A TUNER ALIGNMENT

An RF unit which is operative and requires only minor touch-up adjustments requires no presetting of adjustments.
Where complete alignment is necessary preset A18 all the way out. Set channel 7 to 13 oscillator slugs one turn from maximum clockwise.
Set IF grid transformer slug (A13) all the way out. (See tuner KRK12 for location of A13).
Disconnect the link from terminals A and B of L15 and terminate the link with a 39Ω carbon resistor.
A18 is adjusted with zero bias. To insure a constant bias short AGC tuner terminal to ground.
Connect the potentiometer arm of the bias supply to the AGC terminal on the tuner and the positive lead of the supply to the tuner case.
Adjust for a -3.0V at the point of application. Tuner alignment as outlined below requires the use of a heterodyne frequency meter.
The oscillator injection voltage measured at point Ⓓ with a VTVM should be maintained between 3 volts and 5.5 volts.
Connect the synchronised sweep voltage from the sweep generator to the horizontal input of the oscilloscope for horizontal deflection.
The sweep generator output lead should be terminated with its characteristic impedance, usually 50 ohms.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
13.	.0015MFD	High side to point Ⓐ. Low side to chassis.	Not used	42MC (400\Mod)	2	Vert. Amp. to point Ⓓ. Low side to chassis.	A18	Adjust for MINIMUM 400% indication on oscilloscope.
14.		RF input of heterodyne frequency meter to end of insulated wire inserted in hole in tuner provided for adjustment of A21.	"	Set Freq. Meter to 227MC	8	Not used	A19, A20	Set fine tuning control fully clockwise. Adjust A20 for audible beat on frequency meter. Turn A19 clockwise until a change in beat note occurs and continue for one full turn in same clockwise direction. Return fine tuning control to its center position.
15.	Two 130Ω Carbon Resistors	Across antenna terminals with 130Ω in each lead. Attenuate signal generator for low signal input.	183MC (10MC Swp)	181.25MC 185.75MC	"	Vert. Amp. to point Ⓓ. Low side to chassis.	A21, A22, A23, A24	Set A18 to maximum counter clockwise rotation. Adjust A21, A22, A23 and A24 for response similar to Fig. 6.
16.	Turn off all generators, connect VTVM to point Ⓓ and adjust A26 for -3 volts.							
17.	Repeat Step 15.							
18.		Connect frequency meter as in Step 14.	Not used	Freq. meter to 207MC	13	Not used	A25	Adjust for audible beat on frequency meter. SLIGHTLY overshoot the adjustments a little more in the same direction from the original setting. Then adjust A19 to again obtain audible beat.
19.	Two 130Ω Carbon Resistors	Across antenna terminals with 130Ω in each lead.	213MC (10MC Swp)	211.25MC 215.75MC	"	Vert. Amp. to point Ⓓ. Low side to chassis.	A27, A28	Check for response similar to Fig. 6. Check the oscillator injection voltage (-2 to 5.5V as in step 16. If A26 required adjustment recheck channel 13 response. Switch to channel 8. Readjust A21, A22, A23 and A24 as necessary. If A21 was readjusted check oscillator injection voltage on channel 13 as in Step 16.
20.		Connect frequency meter as in Step 14.	Not used	Set Freq. Meter to 227MC	8	Not used		Check for audible beat on frequency meter. If necessary, adjust A19, overshoot the adjustment and correct by adjusting A25.
21.		"	"	Set Freq. Meter to 139MC	6	"	L39	Set fine tuning control to its mid-range position. Adjust for audible beat on frequency meter.
22.	Two 130Ω Carbon Resistors	Across antenna terminals with 130Ω in each lead.	85MC (10MC Swp)	83.25MC 87.75MC	"	Vert. Amp. to point Ⓓ. Low side to chassis.	A30, A31, A32	Check for response similar to Fig. 6. If necessary, adjust A30, A31 and A32. Check oscillator injection voltage as in Step 16. If A26 required adjustment switch receiver and generator to channel 8. Readjust A21 for proper curve shape. Recheck A19 and A20 for correct oscillator frequency.
23.	"	"	85MC (10MC Swp)	83.25MC 87.75MC	6	"		Check for response as in Fig. 6, and for proper oscillator injection voltage at point Ⓓ. If markers fall below 80% on the response curve retouch A30, A31 and A32 when necessary.
			79MC (10MC Swp)	77.25MC 81.75MC	5			
			69MC (10MC Swp)	67.25MC 71.75MC	4			
			63MC (10MC Swp)	61.25MC 65.75MC	3			
			57MC (10MC Swp)	55.25MC 59.75MC	2			
24.	"	"	213MC (10MC Swp)	211.25MC 215.75MC	13	"		Check for proper response as in Fig. 6. Retouch A21, A22 and A23 as necessary.
			207MC (10MC Swp)	205.25MC 209.75MC	12			
			201MC (10MC Swp)	199.25MC 203.75MC	11			
			195MC (10MC Swp)	193.25MC 197.75MC	10			
			189MC (10MC Swp)	187.25MC 191.75MC	9			
			183MC (10MC Swp)	181.25MC 185.75MC	8			
			177MC (10MC Swp)	175.25MC 179.75MC	7			
25.		Connect frequency meter as in Step 14.	Not used	Set Freq. meter to 257MC	13	Not used		Adjust A25 for audible beat on frequency meter.
26.		"	"	261MC	12	"	A33	Adjust for audible beat on frequency meter.
				245MC	11		A34	
				239MC	10		A35	
				233MC	9		A36	
				227MC	8		A37	
				221MC	7		A38	
				139MC	6		A39	
				123MC	5		A40	
				115MC	4		A41	
				107MC	3		A41	
				101MC	2		A42	

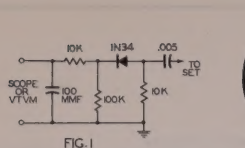

FIG. 1

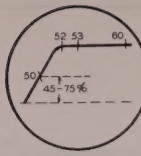

FIG. 2

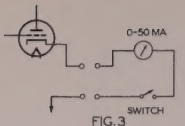

FIG. 3

FIG. 4

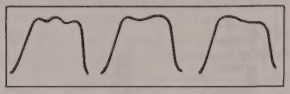
FIG. 5

FIG. 6

TELEVISION CHANNEL FREQUENCIES

Channel No.	Frequency Band (Mc)	Video Carrier	Sound Carrier
2	54-60	55.25	59.75
3	60-66	61.25	65.75
4	66-72	67.25	71.75
5	76-82	77.25	81.75
6	82-88	83.25	87.75
7	174-180	175.25	179.75
8	180-186	181.25	185.75
9	186-192	187.25	191.75
10	192-198	193.25	197.75
11	198-204	199.25	203.75
12	204-210	205.25	209.75
13	210-216	211.25	215.75
14	470-476	471.25	475.75
15	476-482	477.25	481.75
16	482-488	483.25	487.75
17	488-494	489.25	493.75
18	494-500	495.25	499.75
19	500-506	501.25	505.75
20	506-512	507.25	511.75
21	512-518	513.25	517.75
22	518-524	519.25	523.75
23	524-530	525.25	529.75
24	530-536	531.25	535.75
25	536-542	537.25	541.75
26	542-548	543.25	547.75
27	548-554	549.25	553.75
28	554-560	555.25	559.75
29	560-566	561.25	565.75
30	566-572	567.25	571.75
31	572-578	573.25	577.75
32	578-584	579.25	583.75
33	584-590	585.25	589.75
34	590-596	591.25	595.75
35	596-602	597.25	601.75
36	602-608	603.25	607.75
37	608-614	609.25	613.75
38	614-620	615.25	619.75
39	620-626	621.25	625.75
40	626-632	627.25	631.75
41	632-638	633.25	637.75
42	638-644	639.25	643.75
43	644-650	645.25	649.75
44	650-656	651.25	655.75
45	656-662	657.25	661.75
46	662-668	663.25	667.75
47	668-674	669.25	673.75
48	674-680	675.25	679.75
49	680-686	681.25	685.75
50	686-692	687.25	691.75
51	692-698	693.25	697.75
52	698-704	699.25	703.75
53	704-710	705.25	709.75
54	710-716	711.25	715.75
55	716-722	717.25	721.75
56	722-728	723.25	727.75
57	728-734	729.25	733.75
58	734-740	735.25	739.75
59	740-746	741.25	745.75
60	746-752	747.25	751.75
61	752-758	753.25	757.75
62	758-764	759.25	763.75
63	764-770	765.25	769.75
64	770-776	771.25	775.75
65	776-782	777.25	781.75
66	782-788	783.25	787.75
67	788-794	789.25	793.75
68	794-800	795.25	799.75
69	800-806	801.25	805.75
70	806-812	807.25	811.75
71	812-818	813.25	817.75
72	818-824	819.25	823.75
73	824-830	825.25	829.75
74	830-836	831.25	835.75
75	836-842	837.25	841.75
76	842-848	843.25	847.75
77	848-854	849.25	853.75
78	854-860	855.25	859.75
79	860-866	861.25	865.75
80	866-872	867.25	871.75
81	872-878	873.25	877.75
82	878-884	879.25	883.75
83	884-890	885.25	889.75

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*TRADE MARK

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CHASSIS 20Y4D

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ADMIRAL MODEL C28B6N

TRADE NAME	Admiral Models C28B6, C28B6N, C28B7 (Ch. 20Y4D)
MANUFACTURER	Admiral Corp., 3800 W. Cortland St., Chicago 47, Illinois
TYPE SET	Television Receiver
TUBES	Twenty
POWER SUPPLY	110-120 Volts AC-60 Cycles — RATING 1.8 Amp. @ 117 Volts AC
TUNING RANGE	Channel 2 thru 13, Video IF 25.75MC, Sound IF 21.25MC (Intercarrier)

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CHASSIS 20Y4D

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[illegible] ST.
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DISASSEMBLY INSTRUCTIONS

CHASSIS REMOVAL

1. Remove 4 push-on type control knobs from front panel of cabinet.

2. Remove 8 wood screws and 2 metal screws. Remove rear cover.

3. Remove picture tube socket, ion trap, dial light plug, HV lead, speaker plug and 2 control assembly plugs.

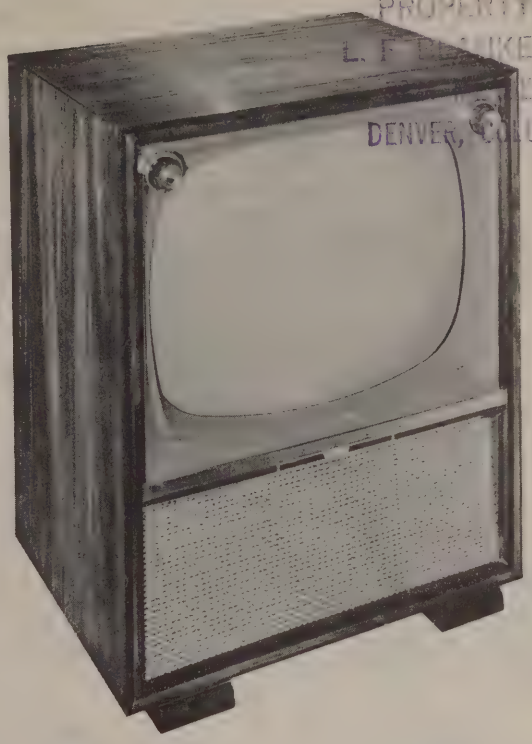
4. Remove 2 wood screws from AC interlock bracket and 2 wood screws from antenna terminal bracket.

5. Remove 1 wood screw from bracket on cabinet and 2 metal screws from bracket on tuner.

6. Remove 4 chassis bolts. Remove chassis.

7. Remove 4 speaker nuts. Remove speaker.

NOTE: If it is to remove the chassis for servicing, it is also necessary to remove the speaker. The audio output transformer is mounted on the speaker and must be connected for proper operation.



MODELS	CHASSIS
C28B6, C28B6N, C28B7	20Y4D

ADMIRAL
CHASSIS 20Y4D

SERVICING IN THE FIELD

TUNER OSCILLATOR ADJUSTMENTS

Touch-up adjustments of the VHF tuner oscillator circuit may be accomplished by removal of the channel selector and fine tuning knobs. The adjustments are accessible, one at a time, thru the small hole in the cabinet to the right of the channel selector shaft.

PICTURE TUBE SAFETY GLASS CLEANING

Remove 4 push-on type control knobs from front panel of cabinet. Remove 4 wood screws holding metal strip at the top edge of the safety glass. Remove metal strip and safety glass. Use extreme caution when removing safety glass.

SERVICE ADJUSTMENT LOCATION

See tube placement chart on page 5.

SPECIAL ADJUSTMENTS

A. Noise Gate

In normal signal areas the noise gate control (R7) will usually be in the fully counter clockwise position. In weak signal and high noise level areas, adjust for minimum snow in picture. This position will usually be fully clockwise.

HORIZONTAL OSCILLATOR FIELD ADJUSTMENT

Adjustment of the horizontal oscillator circuit may be made by adjusting the flexible shaft at the back of the set. Adjust the horizontal adjustment slug (L22) until the picture synchronizes horizontally.

SOUND IF DETECTOR BUZZ ADJUSTMENT

To eliminate "Sound IF Detector Buzz", adjust the ratio detector secondary (L21) located on the rear of the chassis.

CENTERING

Centering is accomplished mechanically by means of a centering lever on the PM focusing assembly. Adjust the centering lever from side to side, and up and down until the picture is properly centered.

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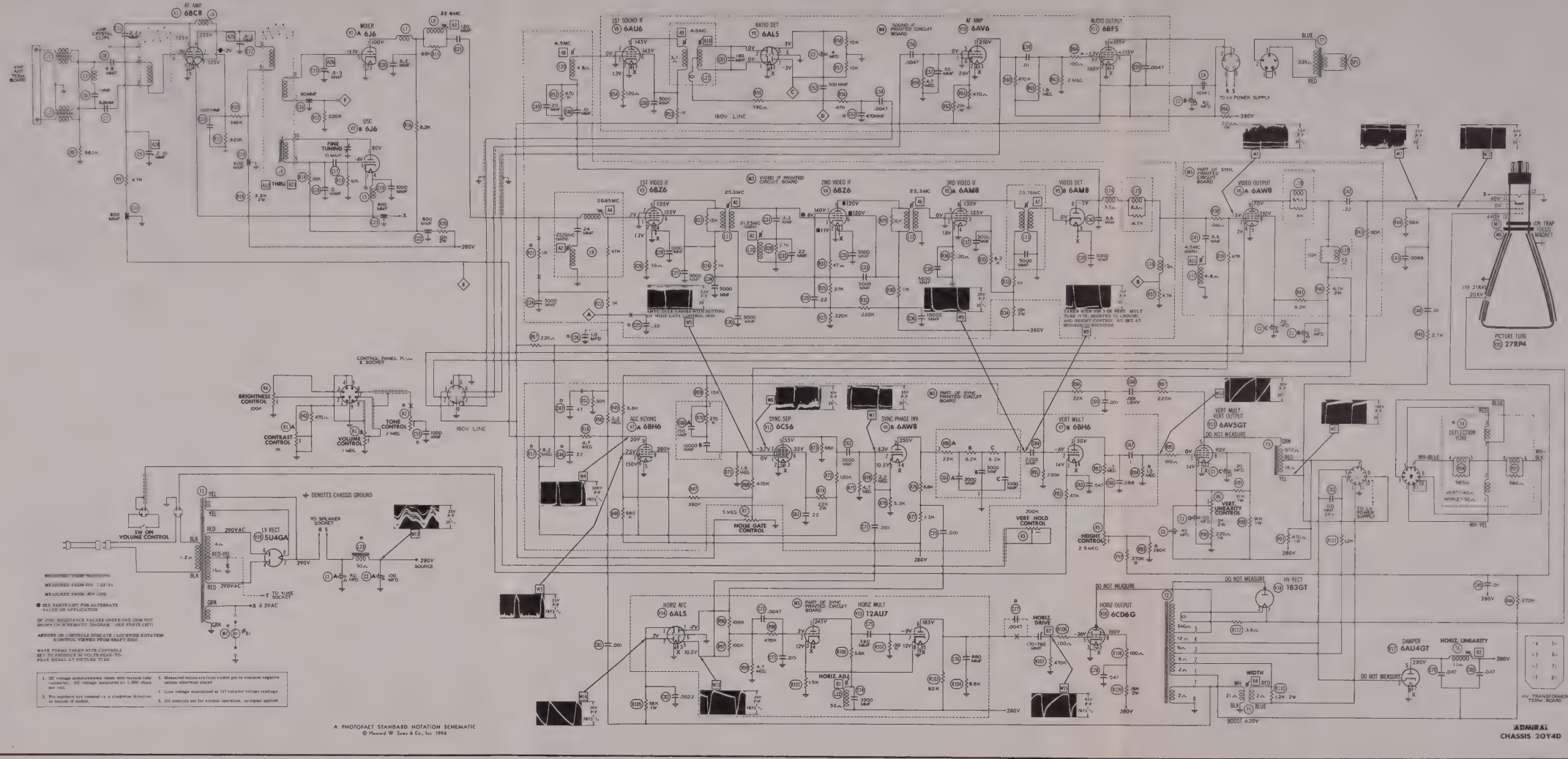
RF AMP V1 6BC8
MIXER V7 A 6J6
OSC V7 B 6J6
1ST SOUND IF V8 6AU6
RATIO DET V9 6AL5
AF AMP V10 6AV6
AUDIO OUTPUT V11 6BF5
1ST VIDEO IF V2 6BZ6
2ND VIDEO IF V4 6BZ6
3RD VIDEO IF V5 A 6AM8
VIDEO DET V5 B 6AM8
VIDEO OUTPUT V6 A 6AW8
SYNC SEP V12 6CS6
SYNC PHASE INV V5 B 6AW8
AGC KEYING V7 A 6BH6
VERT MULT V7 B 6BH6
VERT MULT VERT OUTPUT V13 6AV5GT
HORIZ AFC V14 6AL5
HORIZ MULT V13 12AU7
HORIZ OUTPUT V16 6CD6G
DAMPER V17 6AU4GT
HV RECT V18 1B3GT
LV RECT V19 5U4GA
PICTURE TUBE V20 27RP4
DENOTES CHASSIS GROUND
160V LINE
280V
TO LV POWER SUPPLY
TO SPEAKER SOCKET
TO TUNER SOCKET
6.3VAC
290VAC
SW ON VOLUME CONTROL
BRIGHTNESS CONTROL 100K
CONTRAST CONTROL 1K
VOLUME CONTROL 1 MEG
TONE CONTROL 2 MEG
NOISE GATE CONTROL 5 MEG
VERT HOLD CONTROL 200K
HEIGHT CONTROL 2.5 MEG
VERT LINEARITY CONTROL 91K 1W
HORIZ. ADJ. 15K
WIDTH 2K 1.2K 2W
HORIZ. LINEARITY
DEFLECTION YOKE
ION TRAP FOCUS MAGNET
HV TRANSFORMER TERM. BOARD
DO NOT MEASURE
BOOST 620V
SEE PARTS LIST FOR ALTERNATE VALUE OR APPLICATION
DC COIL RESISTANCE VALUES UNDER ONE OHM NOT SHOWN ON SCHEMATIC DIAGRAM - (SEE PARTS LIST)
ARROWS ON CONTROLS INDICATE CLOCKWISE ROTATION (CONTROL VIEWED FROM SHAFT END)
WAVE FORMS TAKEN WITH CONTROLS SET TO PRODUCE 50 VOLTS PEAK-TO-PEAK SIGNAL AT PICTURE TUBE
1. DC voltage measurements taken with vacuum tube voltmeter, AC voltage measured at 1,000 ohms per volt.
2. Pin numbers are counted in a clockwise direction on bottom of socket.
3. Measured values are from socket pin to common negative unless otherwise stated
4. Line voltage maintained at 117 volts for voltage readings
5. All controls set for normal operation, no signal applied
A PHOTOFACT STANDARD NOTATION SCHEMATIC
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ADMIRAL
CHASSIS 20Y4D

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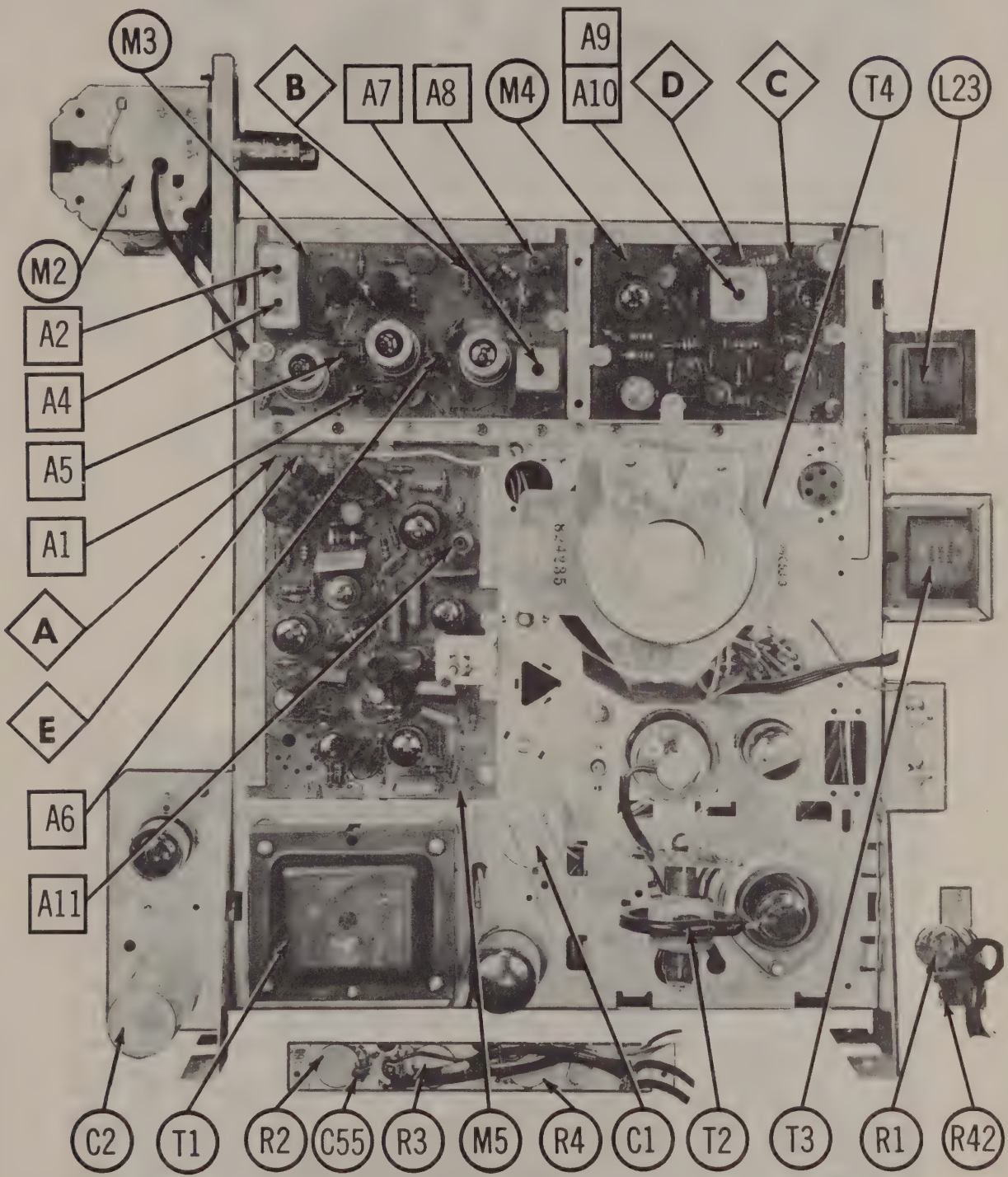
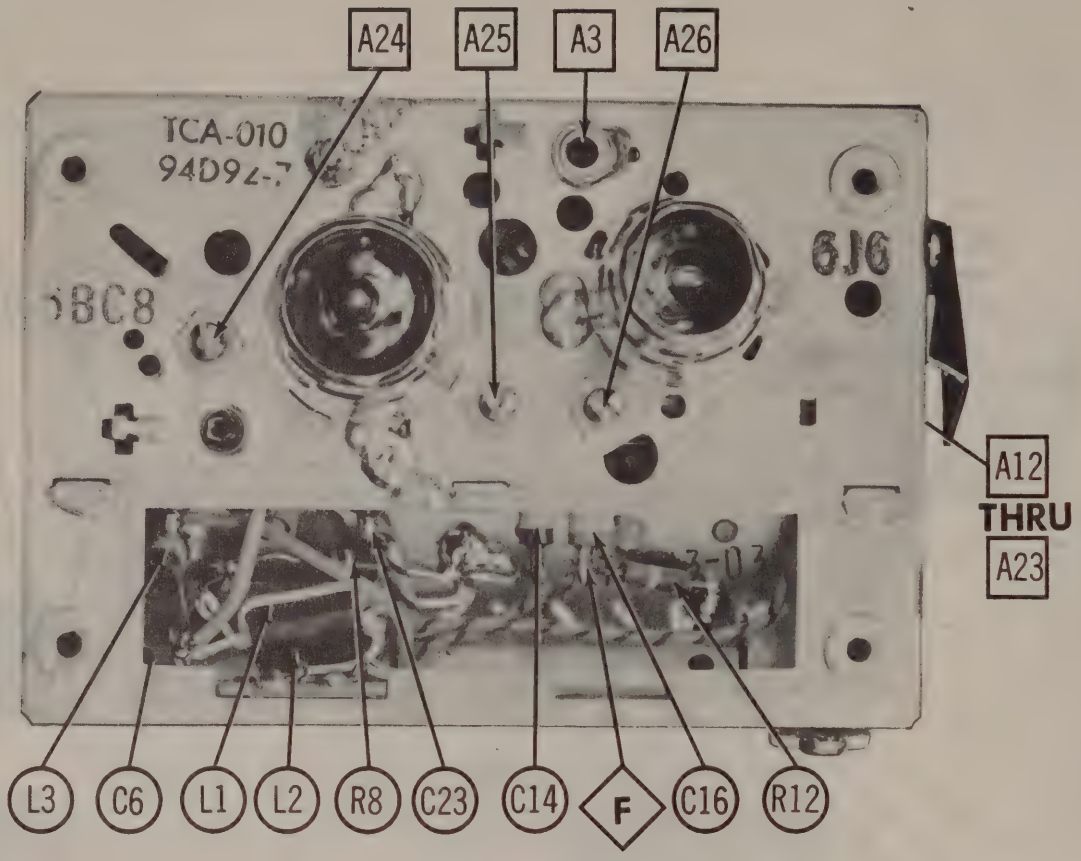


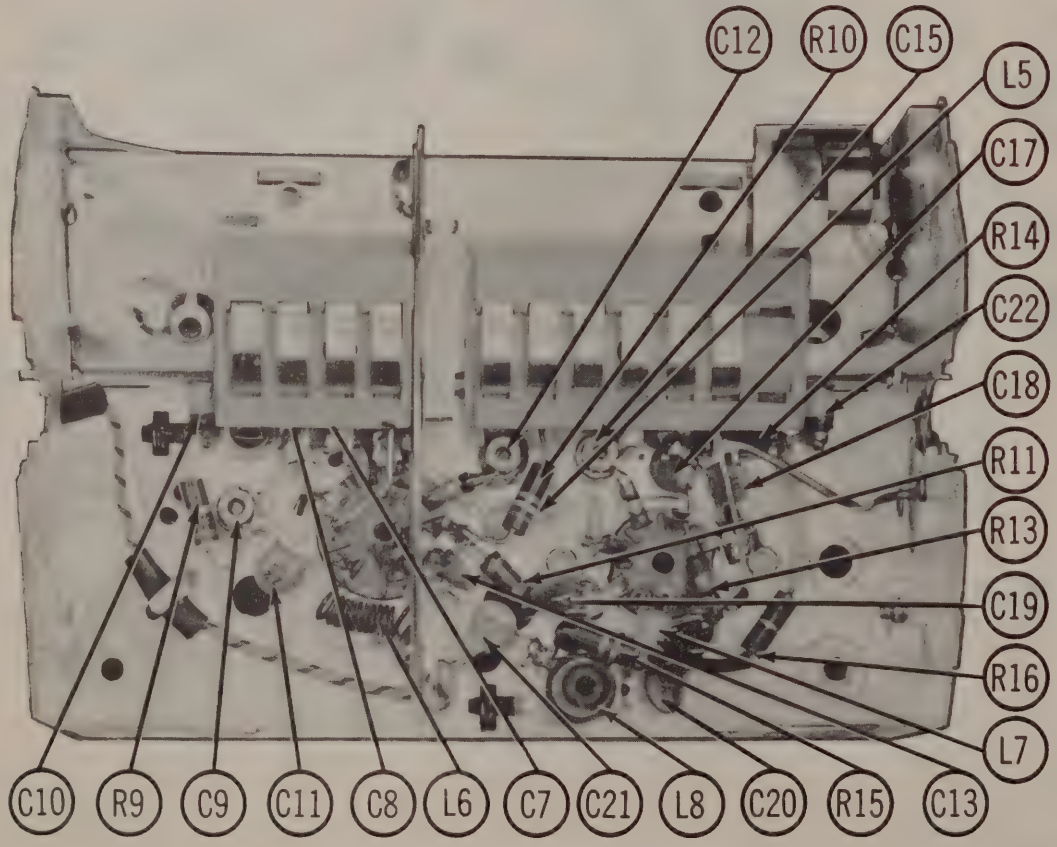
ADMIRAL
CHASSIS 20Y4D

CHASSIS TOP VIEW

SET 323 FOLDER 2

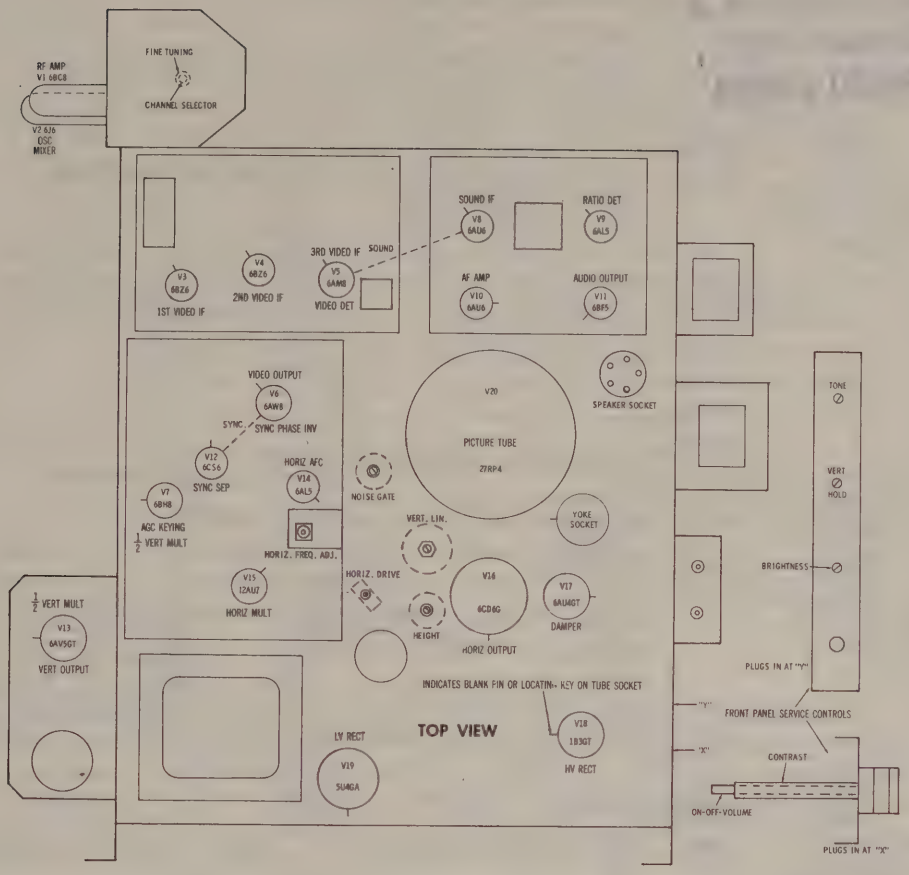


RF TUNER-TOP VIEW



RF TUNER-BOTTOM VIEW

TUBE PLACEMENT CHART



TUBE FAILURE CHECK CHART

The following chart lists tubes whose failures are most likely to produce the indicated symptoms. Refer to tube placement chart for location and type of tube.

POWER SUPPLY FAILURE
No raster, no sound - **V19**

LOSS OF PICTURE OR SOUND
No pic, no sound, has raster - **V2, V3, V4, V5, V11**
No pic, no sound, has snow - **V1, V2, V3**
No pic, has sound, has raster - **V6, V7, V20**
Has pic, no sound - **V8, V9, V10, V11**
Overloaded picture - **V7**

SYNC FAILURE
No vert. sync - **V6, V7, V13**
No horiz. sync - **V6, V14, V15**
No vert. or horiz. sync - **V6, V12**

SWEEP FAILURE
No raster, has sound - **V15, V16, V17, V18, V20**
No vertical deflection - **V7, V13**
Poor vert. linearity or foldover - **V7, V13**
Poor horiz. linearity or foldover - **V15, V16, V17**
Narrow picture - **V15, V16, V17, V18, V19**
Vert. off freq. - **V6, V7, V13**
Horiz. off freq. - **V6, V14, V15**

ALIGNMENT INSTRUCTIONS

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

The high voltage lead should be securely taped away from the chassis.

VIDEO IF ALIGNMENT

Remove the Mixer-osc. tube (V2) from its socket and replace with a 6J6 having pin 1 removed.
Disconnect the antenna leads and connect a short jumper lead across the antenna terminals.
Set the contrast control fully counter clockwise.
Connect the negative lead of a 3 volt bias battery to point Ⓐ.
Connect positive to chassis.
For steps 1 and 2 use a strong signal from the signal generator but for all other steps use only enough generator output to provide usable indication on VTVM. Use lowest scale on VTVM.
Allow 15 to 20 minutes for test equipment warm-up period.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	CHANNEL	CONNECT VTVM	ADJUST	REMARKS
1.	Direct	High side to an ungrounded tube shield floating over dummy converter tube. Low side to chassis.	21.25MC (Unmod)	Any unused high band channel	DC probe thru decoupling network (Fig.1) to point Ⓑ. Common to chassis.	A1	Adjust for MINIMUM deflection.
2.	"	"	27.25MC	"	"	A2	"
3.	"	"	22.6MC	"	"	A3	Adjust for maximum deflection.
4.	"	"	26.85MC	"	"	A4	"
5.	"	"	25.3MC	"	"	A5	"
6.	"	"	22.3MC	"	"	A6	"
7.	"	"	23.75MC	"	"	A7	"

OVERALL VIDEO IF RESPONSE CHECK

Leave bias connected as under "Video IF Alignment".
Use only enough sweep generator output to provide usable pattern on scope.
Connect the synchronized sweep voltage from the sweep generator to the horizontal input of the oscilloscope for horizontal deflection.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
8.	Direct	High side to ungrounded tube shield floating over dummy converter tube. Low side to chassis.	23.0MC	21.25MC 22.0MC 23.0MC 25.0MC 25.75MC	Any Unused High band channel	Vert. Amp. thru decoupling network (Fig.1) to point Ⓑ. Low side to chassis.		Check for response similar to Fig.2. If necessary, retouch A1 thru A7 to obtain desired response. Adjust A4 and A5 for position of 25.75MC marker and amplitude of response curve on high frequency side. Adjust A3 and A6 for position of 23.0MC marker and amplitude of response curve on low frequency side.

SOUND IF ALIGNMENT USING AM SIGNAL GENERATOR AND VTVM

Disconnect antenna and short antenna terminals together with a short clip lead.
Set contrast control for minimum contrast.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	CHANNEL	CONNECT VTVM	ADJUST	REMARKS
9.	.01MFD	High side to pin 8 (plate) of 6AM8 (V5). Low side to chassis.	4.5MC (Unmod)	Any non-interfering channel	DC probe to point Ⓒ. Common to chassis.	A8, A9	Attenuate output of generator to maintain 1 volt at VTVM. Adjust for maximum deflection.
10.	"	"	"	"	DC probe to point Ⓓ. Common to chassis.	A10	Adjust for zero reading. A positive and negative reading will be obtained on either side of the correct setting.

SOUND IF ALIGNMENT USING FM SIGNAL GENERATOR AND OSCILLOSCOPE

Use frequency modulated signal with 60% modulation and 450KC sweep. Use 120% sawtooth voltage in scope for horizontal deflection.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
9.	.01MFD	High side to pin 8 (plate) of 6AM8 (V5). Low side to chassis.	4.5MC (450KC Swp)	4.5MC	Any	Vert. Amp. to point Ⓒ. Low side to chassis.	A8, A9	Disconnect stabilizing capacitor C3. Adjust for curve of maximum amplitude and symmetry similar to Fig.3.
10.	"	"	"	"	"	Vert. Amp. to point Ⓓ. Low side to chassis.	A10	Reconnect C3. Adjust A10 so that 4.5MC marker occurs at center of crossover lines as in Fig. 4. SLIGHTLY retouch A9 for maximum amplitude and straightness of crossover lines.

SOUND IF ALIGNMENT USING ON THE AIR SIGNAL

Remove the bias and replace the original converter tube in its socket.
Tune in a TV station. Adjust A8 and A9 for maximum deflection with the VTVM connected as in step 9 of "Sound IF Alignment Using AM Signal Generator and VTVM". Adjust A10 for best program sound with minimum buzz. This point will be found between two maximum buzz peaks.

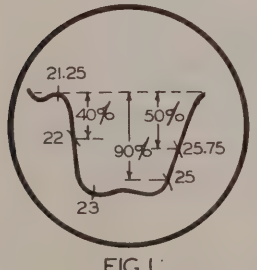


FIG.1

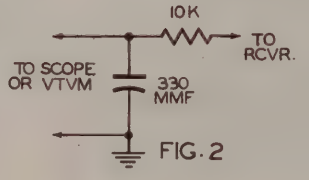


FIG. 2

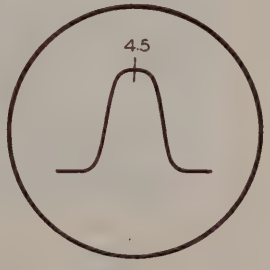


FIG. 3

ALIGNMENT INSTRUCTIONS (cont)

4.5MC TRAP ALIGNMENT

Short L15 with a short jumper wire.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	CHANNEL	CONNECT VTVM	ADJUST	REMARKS
11.	.01MFD	High side to pin 8 (plate) of 6AM8 (V5). Low side to chassis.	4.5MC (Unmod)	Any	DC probe to point Ⓒ. Common to chassis.	All	Adjust for MINIMUM deflection.

ALTERNATE 4.5MC TRAP ALIGNMENT

Tune in a TV station and adjust All for minimum 4.5MC beat interference in picture.

OSCILLATOR ALIGNMENT

Replace the original oscillator tube in its socket. The channel oscillator adjustment screws are reached through a hole to the right of the channel switch shaft. The correct adjustment screws are accessible through this hole as the channel switch is turned to each channel.
Leave the bias connected as under "Video IF Alignment".
Connect the synchronized sweep voltage from the sweep generator to the horizontal input of the oscilloscope for horizontal deflection.
The sweep generator output lead should be terminated with its characteristic impedance, usually 50 ohms.
Set the fine tuning control to the mid-position of its range.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
12.	Two 120Ω Carbon Resistors	Across antenna terminals with 120Ω in each lead.	213MC (10MC Swp)	211.25MC 215.75MC	13	Vert. Amp. thru decoupling network (Fig.1) to point Ⓑ. Low side to chassis.	A12	Adjust to place video marker at 50% as in Fig. 5. Sound marker should not exceed 5% on response curve.
			207MC (10MC Swp)	205.25MC 209.75MC	12		A13	
			201MC (10MC Swp)	199.25MC 203.75MC	11		A14	
			195MC (10MC Swp)	193.25MC 197.75MC	10		A15	
			189MC (10MC Swp)	187.25MC 191.75MC	9		A16	
			183MC (10MC Swp)	181.25MC 185.75MC	8		A17	
			177MC (10MC Swp)	175.25MC 179.75MC	7		A18	
			85MC (10MC Swp)	83.25MC 87.75MC	6		A19	
			79MC (10MC Swp)	77.25MC 81.75MC	5		A20	
			69MC (10MC Swp)	67.25MC 71.75MC	4		A21	
			63MC (10MC Swp)	61.25MC 65.75MC	3		A22	
			57MC (10MC Swp)	55.25MC 59.75MC	2		A23	

RF AND MIXER ALIGNMENT

Leave bias connected as under "Video IF Alignment". The bias may be removed if it is difficult to obtain a response of sufficient amplitude. If bias is removed, short to chassis point where bias was connected.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
13.	Two 120Ω Carbon Resistors	Across antenna terminals with 120Ω in each lead.	195MC (10MC Swp)	193.25MC 197.75MC	10	Vert. Amp. thru 10KΩ to point Ⓕ. Low side to chassis.	A24, A25, A26	Adjust for response similar to Fig. 6 with markers above 90%.
14.	"	"	213MC (10MC Swp)	211.25MC 215.75MC	13	"		Check for response similar to Fig. 6. If markers fall below 70% on any channel, make compromise adjustments of A24, A25 and A26 with channel switch set for that channel. Recheck all other channels to see that they have not been seriously affected.
			207MC (10MC Swp)	205.25MC 209.75MC	12			
			201MC (10MC Swp)	199.25MC 203.75MC	11			
			189MC (10MC Swp)	187.25MC 191.75MC	9			
			183MC (10MC Swp)	181.25MC 185.75MC	8			
			177MC (10MC Swp)	175.25MC 179.75MC	7			
			85MC (10MC Swp)	83.25MC 87.75MC	6			
			79MC (10MC Swp)	77.25MC 81.75MC	5			
			69MC (10MC Swp)	67.25MC 71.75MC	4			
			63MC (10MC Swp)	61.25MC 65.75MC	3			
			57MC (10MC Swp)	55.25MC 59.75MC	2			

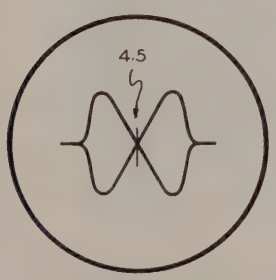


FIG. 4

FIG.5

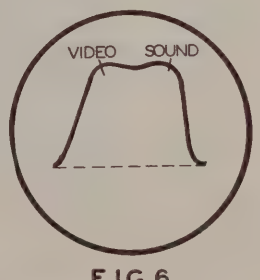
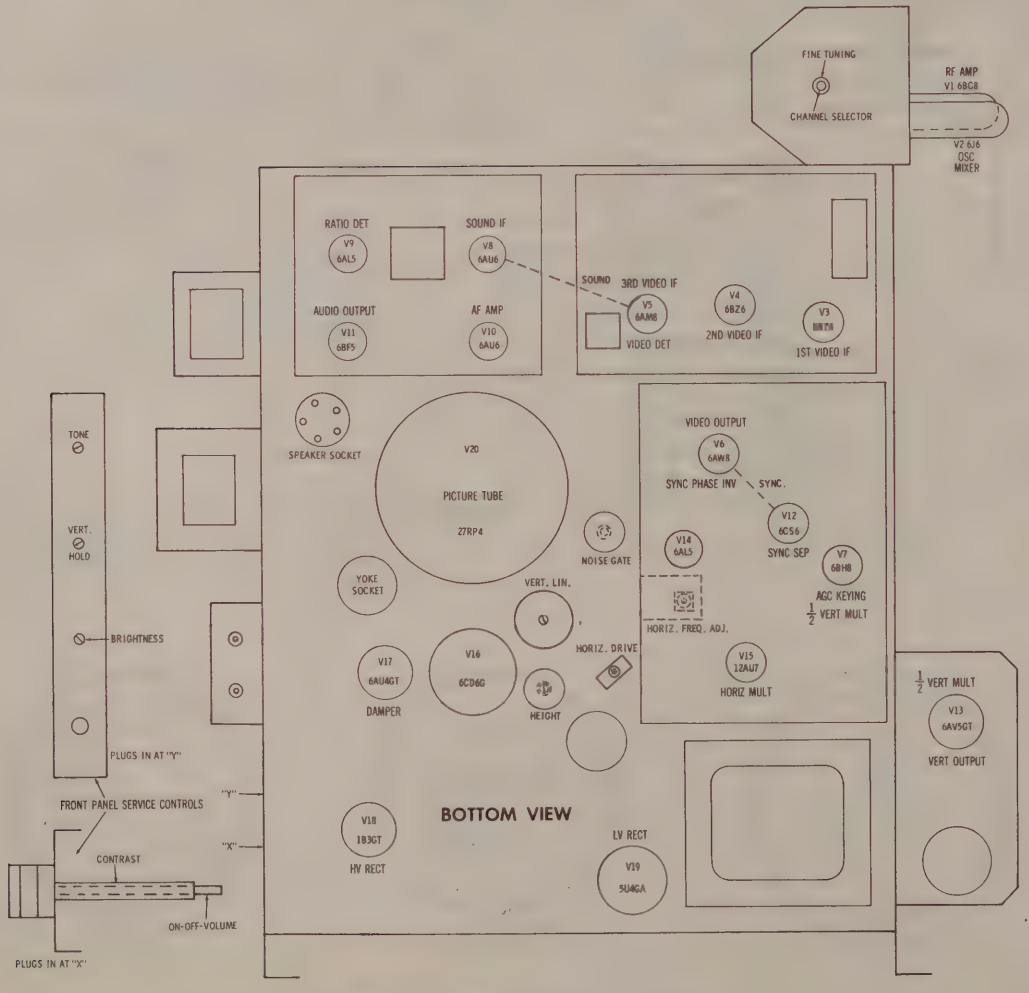


FIG.6

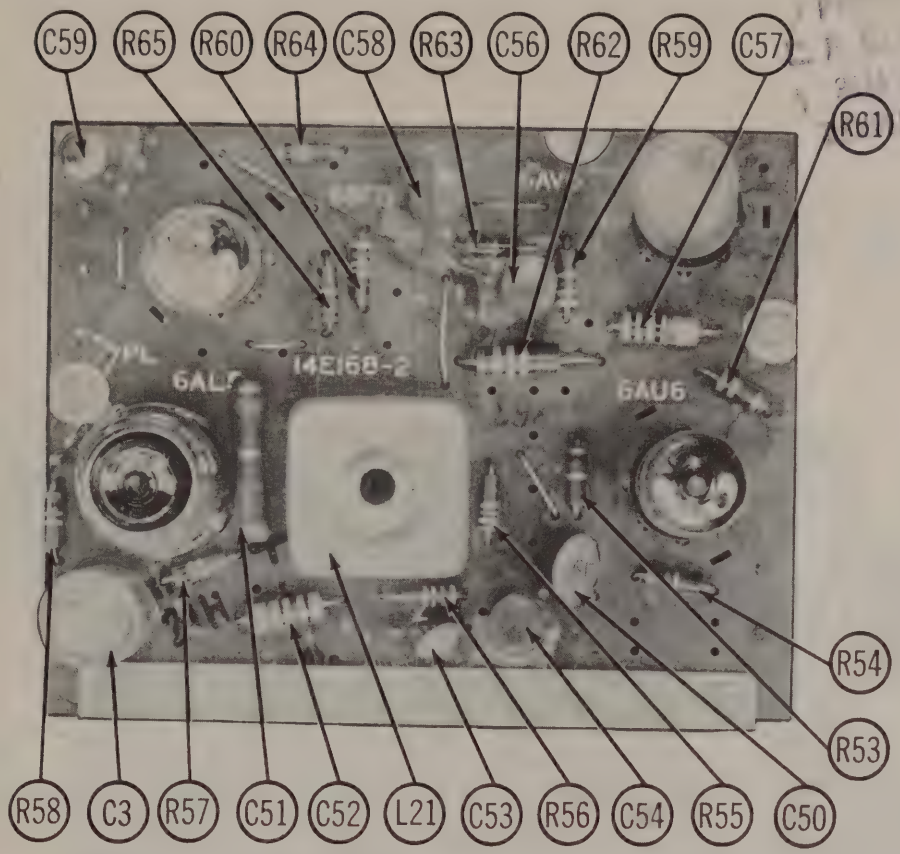
RESISTANCE MEASUREMENTS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V 1	6BC8	INF	3.5Meg	0Ω	0Ω	.1Ω	† 3.3KΩ	300KΩ	INF	0Ω
V 2	6J8	† 25KΩ	† 23KΩ	0Ω	.1Ω	220KΩ	10KΩ	0Ω		
V 3	6BZ6	150KΩ	56Ω	0Ω	.1Ω	▲ 1KΩ	▲ 1KΩ	0Ω		
V 4	6BZ6	100KΩ	▲ 47Ω	.1Ω	0Ω	† 1KΩ	† 1KΩ	130KΩ		
V 5	6AM8	120Ω	.4Ω	† 18KΩ	0Ω	.1Ω	† 11KΩ	.3Ω	4.7KΩ	0Ω
V 6	6AW8	3.3KΩ	1.5Meg	† 10KΩ	.1Ω	0Ω	10Ω	4.7KΩ	■ 8.5KΩ	■ 5KΩ
V 7	6BH8	150KΩ	220KΩ	▲ 3.5Meg	.1Ω	0Ω	■ 220Ω	■ 12KΩ	† 50Ω	2Meg
V 8	6AV6	470KΩ	0Ω	.1Ω	0Ω	■ 1KΩ	■ 1KΩ	120Ω		
V 9	6AL5	INF	INF	.1Ω	0Ω	10KΩ	0Ω	10KΩ		
V 10	6AV6	4.7Meg	470Ω	.1Ω	0Ω	0Ω	0Ω	† 470KΩ		
V 11	6BF5	850KΩ	15KΩ	.1Ω	0Ω	† 500Ω	† 300Ω	850KΩ		
V 12	6CS6	50KΩ	0Ω	.1Ω	0Ω	■ 40KΩ	■ 22KΩ	1.8Meg		
V 13	6AV5GT	1.5Meg	.1Ω	500Ω	NC	† 1KΩ	NC	0Ω	† 50KΩ	
V 14	6AL5	68KΩ	68KΩ	.1Ω	0Ω	4.8Meg	0Ω	4.8Meg		
V 15	12AU7	† 5.6KΩ	5Meg	1.5KΩ	.1Ω	.1Ω	† 80KΩ	150KΩ	1.5KΩ	0Ω
V 16	6CD6G	TP	.1Ω	0Ω	TP	470KΩ	TP	0Ω	† 18KΩ	TOP CAP ▲ 12Ω
V 17	6AU4GT	NC	TP	950KΩ	NC	† 60Ω	TP	.1Ω	0Ω	
V 18	1B3GT		PINS	1-8	HAVE	INF	RESISTANCE			TOP CAP ▲ 550Ω
V 19	5U4GA	TP	60KΩ	NC	15Ω	NC	14Ω	NC	60KΩ	
V 20	27RP4	.1Ω	56KΩ	PIN 10 ▲ 270KΩ	PIN 11 ■ 180KΩ	PIN 12 0Ω				

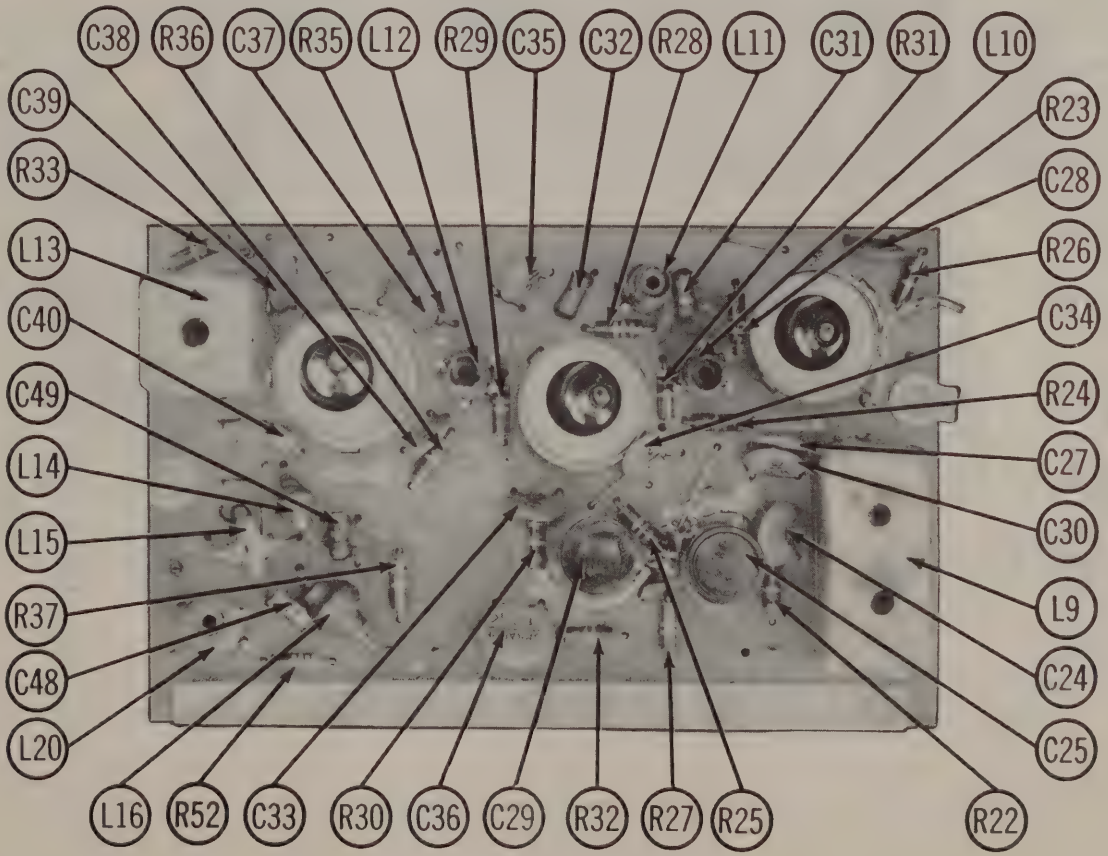
† MEASURED FROM PIN 2 OF V19.
▲ MEASURED FROM PIN 7 OF V4.
▲ MEASURED FROM PIN 3 OF V16.
■ MEASURED FROM 160V LINE.
TP-TIE POINT.
NC-NO CONNECTION.



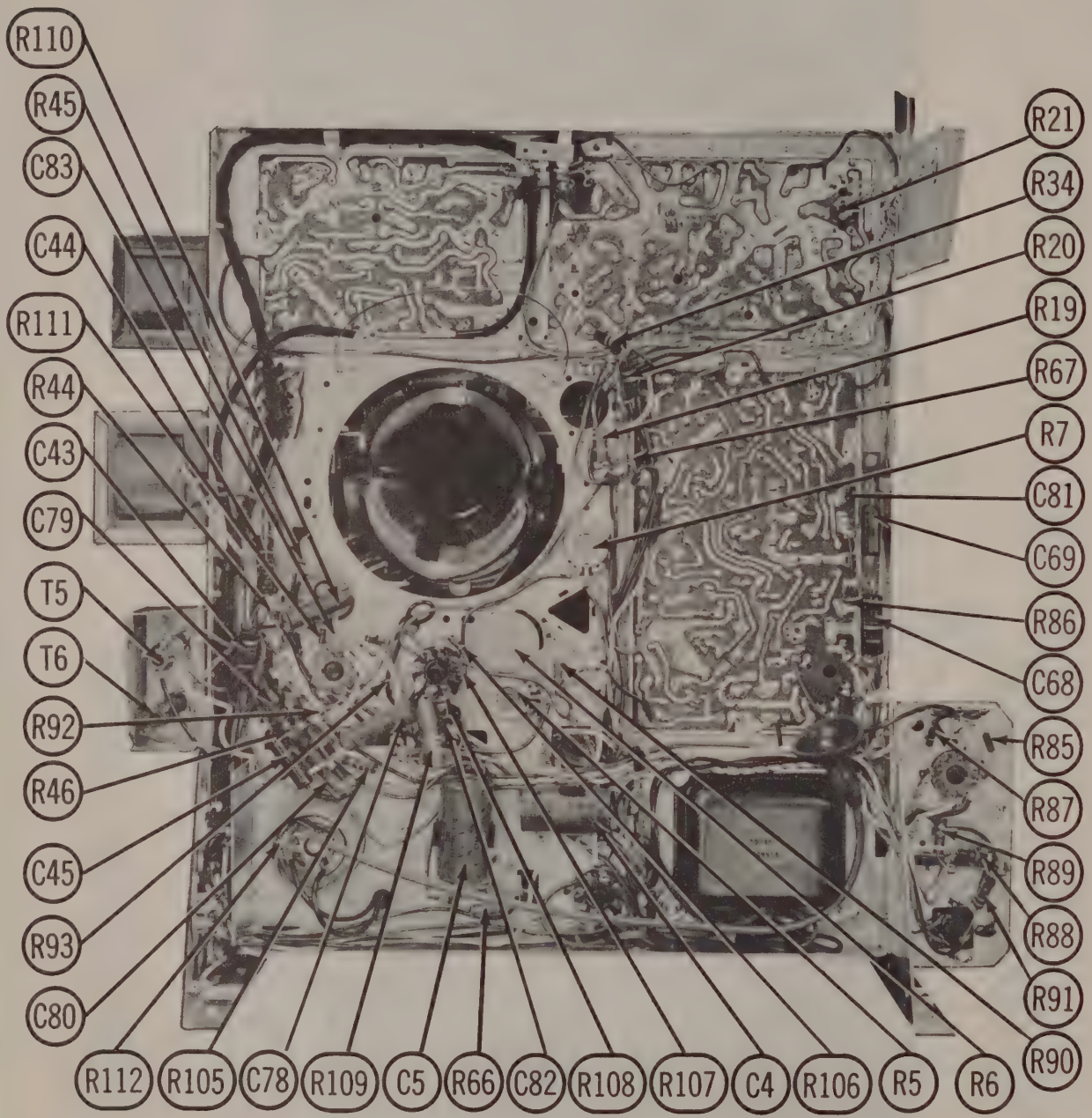
TUBE PLACEMENT CHART



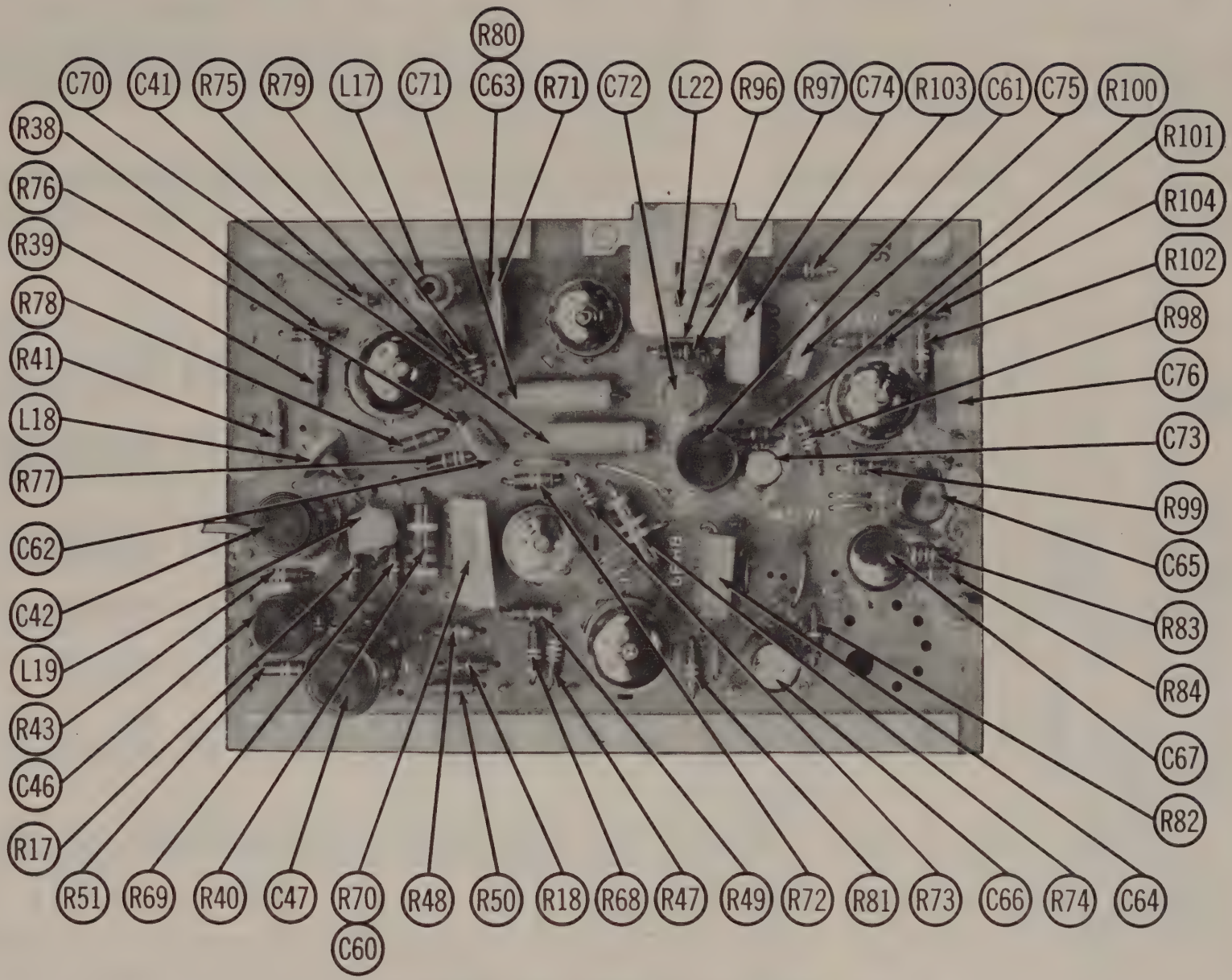
SOUND IF SUB-CHASSIS



VIDEO IF SUB-CHASSIS



CHASSIS BOTTOM VIEW CAPACITOR & RESISTOR IDENT.



SYNC CIRCUIT SUB-CHASSIS

CHASSIS 20Y4D

ADMIRAL

TUBES (GENERAL ELECTRIC, SYLVANIA)

ITEM No.	USE	TYPE	NOTES
V1	RF Amplifier	6BC8	
V2	Mixer-Oscillator	6J6	
V3	1st. Video IF Amplifier	6BZ6	
V4	2nd. Video IF Amplifier	6BZ6	
V5	3rd. Video IF Amplifier-Video Detector	6AM8	
V6	Video Output-Sync Phase Inverter	6AW8	
V7	AGC Keying-Vert. Mult.	6BH8	
V8	Sound IF Amplifier	6AU6	
V9	Ratio Detector	6AL5	
V10	AF Amplifier	6AV6	
V11	Audio Output	6BF5	
V12	Sync Separator	6CS6	
V13	Vert. Mult.-Vert. Output	6AV5GT	
V14	Horiz. AFC	6AL5	
V15	Horiz. Mult.	12AU7	
V16	Horiz. Output	6CD6G	
V17	Damper	6AU4GT	
V18	HV Rectifier	1B3GT	
V19	LV Rectifier	5U4GA	

PICTURE TUBE

ITEM No.	REPLACEMENT DATA				NOTES
	ADMIRAL PART No.	CBS PART No.	GENERAL ELECTRIC PART No.	SYLVANIA PART No.	
V20	24RP4 ①	27RP4 ①	27RP4 ①	27RP4 ②	① Aluminized ② Silver screen "85"

ELECTROLYTIC CAPACITORS

ITEM No.	RATING		REPLACEMENT DATA						
	CAP.	VOLT.	ADMIRAL PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SANGAMO PART No.	SPRAGUE PART No.
C1A	▲80	350	67D15-32	E4D672	C164	FP368.3	TM-804020-450	Q-167	R2196
B	▲20	200			BR2025	TC55	TD-100-50		
C	■20	350							
D	100	50							
C2A	100	350	67D15-105	E4C632		FP330.9	TM-3144	Q-221.5	R2056
B	■60	350				TC55		MT-2520	
C	▲20	200							
C3	4	50	67B27-3	SRE50V5	BBR4-50	TC30	TD-4-50	MMT-0505	TVA-1303
C4	40	200	67A4-21	PRS250V40	BR4025	TC58	TD-40-250	FM-2540	TVA-1511
C5	40	300	67A4-19	PRS350V40	BR4035	TC78	TD-40-350	FM-4540	TVA-1611

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING		REPLACEMENT DATA							NOTES
	CAP.	VOLT	ADMIRAL PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	
C6	1		94D46-84	NP0-SI1	TCZ-1	TZ03	NP0A-010	ZT-5515	5TCCB-V1	
C7	6.8		94D47-53	NP0-DI6.8	TCZ-6R8	Z013	NP0A-6R8	ZT-5568	5TCCB-V68	
C8	6.8		94D47-53	NP0-DI6.8	TCZ-6R8	Z013	NP0A-6R8	ZT-5568	5TCCB-V68	
C9	2-10		94D92-71		829-10					
C10	800		94C37-90							
C11	2.2		94C37-97	NP0-SI2.2	TCZ-2R2	Z006	NP0A-2R2		5TCCB-V22	
C12	.5-3		98A45-23		829-3		3115-01-0R5	CT565A		
C13	1000			BPD-001	DD-102	K069	801-001	DC-521	5HK-D1	
C14	800		94C37-90							
C15	.5-3		98A45-23		829-3		3115-01-0R5	CT565A		
C16	60		94D92-76							
C17	10		94D47-51	NP0-DI10	TCZ-10	Z018	NP0A-100	ZT-541	5TCC-Q1	
C18	10		94D47-51	NP0-DI10	TCZ-10	Z018	NP0A-100	ZT-541	5TCC-Q1	
C19	1000			BPD-001	DD-102	K069	801-001	DC-521	5HK-D1	
C20	8.2		94D92-74	NP0-DI8.2	TCZ-8R2	Z016	NP0A-8R2			
C21	120		65C6-66	BPD-00012	DD-121	G044	811-121	UC-5312	5GA-T12	
C22	800		94C37-90							
C23	800		94C37-90							
C24	5000		65C43-1	BPD-005	DD-502	K080	811-005	DC-525	5HK-D5	
C25	.33	200							2SE-P33	Note 1
C26	1.0	100	64A10-3	P288N-1.0		CUB2W1		PT41	2TM-M1	Note 2
C27	5000		65C43-1	BPD-005	DD-502	K080	811-005	DC-525	5HK-D5	
C28	5000		65C43-1	BPD-005	DD-502	K080	811-005	DC-525	5HK-D5	
C29	.22	200	64B16-51					PTS4022	2SE-P22	
C30	5000		65C43-1	BPD-005	DD-502	K080	811-005	DC-525	5HK-D5	
C31	3.3		65C6-89	NP0-SI3.3	TCZ-3R3	TZ06	NP0A-3R3	ZT-5533	5TCCB-V33	
C32	22		65C6-113	NP0-SI22	TCZ-22	TZ14	NP0K-220	ZT-542	5TCC-Q2	
C33	5000		65C43-1	BPD-005	DD-502	K080	811-005	DC-525	5HK-D5	
C34	5000		65C43-1	BPD-005	DD-502	K080	811-005	DC-525	5HK-D5	
C35	5000		65C43-1	BPD-005	DD-502	K080	811-005	DC-525	5HK-D5	
C36	10000			BPD-01	DD-103	K082	811-01	DC-511	5HK-S1	
C37	5000		65C43-1	BPD-005	DD-502	K080	811-005	DC-525	5HK-D5	
C38	5000		65C43-1	BPD-005	DD-502	K080	811-005	DC-525	5HK-D5	
C39	5000		65C43-1	BPD-005	DD-502	K080	811-005	DC-525	5HK-D5	
C40	6.8		65B28-068	NP0-SI6.8	TCZ-6R8	TZ08	NP0A-6R8	ZT-5568	5TCCB-V68	
C41	6.8		65B28-068	NP0-SI6.8	TCZ-6R8	TZ08	NP0A-6R8	ZT-5568	5TCCB-V68	
C42	.22	400	64B16-28					PTS4022	4SE-P22	
C43	.0068	600	64B9-14	BPD-0068	D6-682	CUB6D68	GP3-333-682		6TM-D68	
C44	.01	600	64B9-13	BPD-01	D6-103	CUB6S1	GP3-333-103	PT611	6TM-S1	
C45	.01	600	64B9-13	BPD-01	D6-103	CUB6S1	GP3-333-103	PT611	6TM-S1	
C46	.22	200	64B16-51					PTS4022	2SE-P22	Note 3
C47	.47	200	64B16-49						2SE-P47	Note 4
C48	10		65C6-44	SI10	D6-100	TP09	GP1K-100	UC-541	5GA-Q1	
C49	20		65C6-51	NP0-SI20	TCZ-20	TZ13	NP0K-200	ZT-542	5TCC-Q2	
C50	5000		65C43-1	BPD-005	DD-502	K080	811-005	DC-525	5HK-D5	
C51	180		65D10-52							
C52	500		65C39-3	SI500	D6-501	TP47	GP2K-501	UC-535	5GA-T5	
C53	470		65D10-70	BPD-00047	DD-471	K060	831-471	UC-5347	5GA-T47	Note 5
C54	.0047	400	64B16-38	BPD-0047	DD-472	K079	811-0047	PTS4247	4SE-D47	
C55	1000			BPD-001	DD-102	K069	801-001	DC-521	5HK-D1	Notes 2, 6
C56	.0047	400	64B16-38	BPD-0047	DD-472	K079	811-0047	PTS4247	4SE-D47	
C57	50		65C39-11	SI50	D6-500	TP30	GP1K-500	UC-545	5GA-Q5	
C58	.01	400	64B16-36	BPD-01	DD-103	K082	811-01	PTS411	4SE-S1	
C59	.0047	600	64B16-15	BPD-0047	DD-472	K079	811-0047	DC-525	6SE-D47	
C60A	150		†63C9-3	†PA459	†PC-184	TP36	GP2K-151	UC-5315	5GA-T15	
B	10000					K082	811-01	DC-511	5HK-S1	
C61	.22	200	64B16-51					PTS4022	2SE-P22	
C62	5000		65C43-1	BPD-005	DD-502	K080	811-005	DC-525	5HK-D5	
C63A	2000							DC-522		
B	5000		♦63C9-1	♦PA-110	♦PC-100	♦115TM1	♦14 05-01	DC-525	♦V-1	
C	5000							DC-525		
C64	2200	500	65B21-222	1464-0022		1R5D22			MS-222	
C65	.047	200	64B16-32	BPD-05	DF-503			PTS4147	2SE-S47	
C66	.068	400	64B16-31						4SE-S68	
C67	.1	600	64B16-7		DF-104				6SE-P1	
C68	.001	1600	64A2-28							
C69	.001	600	64A2-28	SI1000	D6-102	CUB6D1	GP2L-102	PT621	6TM-D1	
C70	.001	400	64B21-1	SI1000	D6-102	CUB6D1	GP2L-102	PT621	6TM-D1	
C71	.001	400	64B21-1	SI1000	D6-102	CUB6D1	GP2L-102	PT621	6TM-D1	
C72	.0047	400	64B16-38	BPD-0047	DD-472	K079	811-0047	PTS4247	4SE-D47	
C73	.015	200	64B16-58	BPD-015	DD16-153		817-015		2SE-S15	

PARTS LIST AN

CAPAC

ITEM No.	RATING		ADMIRAL PART No.	AEROVOX PART No.	CENTRALAB PART No.
	CAP.	VOLT			
C74	3900	500	65B21-392	1464-0039	
C75	390	500	65B21-391	1469-00039	D6-391
C76	680	500	65B21-681	1464-00068	D6-681
C77	.0047	600	64B9-15	SI4700	D6-472
C78	.047	600	64B9-9	BPD-05	DF-503
C79	.047	600	64A2-14		
C80	.047	600	64A2-14		
C81	.001	600	64A2-28	1464-001	
C82	.0022	600	64B8-17	SI2200	
C83	100	3000	65D10-77		

Note 1. Not used in early versions. Other versions may use
Note 2. Not used in some versions.
Note 3. Early versions use .1MFD in this application (part
Note 4. Not used in early versions.
Note 5. Early versions use .0022MFD in this application (pa
Note 6. Some versions use 5000MMF in this application (pa
† Items C60A, C60B and R70 are combined in one unit.
♦ Items C63A, C63B, C63C, R80A, R80B and R80C are con

CONTR

ITEM No.	RATING		REPLACEMENT		
	RESISTANCE	WATTS	ADMIRAL PART No.	CENTRALAB PART No.	CLAROSTA PART No.
R1A	1000Ω	½	75B11-28	F1-5	RTV-552
B	1Meg	½		R2-54	
C	Switch			KB-1	
R2A	2Meg	½	75C13-64	B-76	A47-2Meg-
B	Shaft		Not Req.	Not Req.	KSS-3
R3A	200KΩ	½	75C13-63	B-46	A47-200K-
B	Shaft		Not Req.	Not Req.	KSS-3
R4A	100KΩ	½	75C13-62	B-40	A47-100K-
B	Shaft		Not Req.	Not Req.	KSS-3
R5A	2. 5Meg	½	75C20-1	BX-83	A47-2.5Meg
B	Shaft		Not Req.	Not Req.	FKS-½
R6A	3000Ω	2	75C13-69		A43-3000
B	Shaft		Not Req.		FKS-¼
R7A	5Meg	½	75C20-28	AB-87	A47-5Meg-
B	Shaft		Not Req.	AK-1	FKS-½

Note 1. Not used in some versions.
Concentrikit Equivalent; K-7 Kit, Base Elements and Shafts; B1
B1
76

RESIST

All wattages 1/2 watt, or less,

ITEM No.	RATING		REPLACEMENT DATA		NOTES
	OHMS	WATT	ADMIRAL PART No.	IRC PART No.	
R8	680KΩ		60B8-684	BTS-680K	
R9	4700Ω		60B8-472	BTS-4700	
R10	560KΩ		60B8-564	BTS-560K	
R11	820KΩ		60B8-824	BTS-820K	
R12	220KΩ		60B8-224	BTS-220K	
R13	10KΩ		60B8-103	BTS-10K	
R14	10KΩ		60B8-103	BTS-10K	
R15	82KΩ		60B8-823		
R16	8200Ω		60B8-822	BTS-8200	
R17	8. 2Meg		60C38-825	BTS-8. 2Meg	Note 1
R18	4. 7Meg		60C38-475	BTS-4. 7Meg	
R19	3300Ω	2	60B20-332	BTB-3300	
R20	15KΩ	2	60B20-153	BTB-15K	
R21	1000Ω		60C38-102	BTS-1000	Note 2
R22	1000Ω		60C38-102	BTS-1000	
R23	13KΩ 5%		60C37-133		
R24	1000Ω		60C38-102	BTS-1000	
R25	27KΩ		60C38-273		
R26	56Ω		60C41-560	BTS-56	
R27	220KΩ		60C38-224		
R28	27KΩ		60C38-273	BTS-27K	
R29	10KΩ 5%		60C37-103	BTS-10K 5%	
R30	1000Ω		60C38-102	BTS-1000	
R31	47Ω		60C41-470	BTS-47	
R32	220KΩ		60C38-224		
R33	1000Ω		60C38-102	BTS-1000	
R34	10KΩ	2	60B20-103	BTB-10K	
R35	8200Ω		60C38-822	BTS-8200	
R36	120Ω		60C38-121	BTS-120	
R37	4700Ω		60C38-472	BTS-4700	
R38	100Ω		60C38-101	BTS-100	
R39	47KΩ		60C38-473	BTS-47K	
R40	4700Ω	2	60B20-472	BTB-4700	
R41	8200Ω		60C38-822	BTS-8200	
R42	470Ω		60B8-471	BTS-470	
R43	180KΩ		60C38-184	BTS-180K	
R44	56KΩ		60B8-563	BTS-56K	
R45	2700Ω		60B8-272	BTS-2700	
R46	270KΩ		60B8-274	BTS-270K	
R47	390KΩ		60C38-394	BTS-390K	
R48	680KΩ		60B8-684	BTS-680K	
R49	6800Ω		60C38-682	BTS-6800	
R50	2. 2Meg		60C38-225	BTS-2. 2Meg	
R51	150KΩ		60C38-154	BTS-150K	
R52	470KΩ		60B8-474	BTS-470K	
R53	1000Ω		60B8-102	BTS-1000	
R54	120Ω		60B8-121	BTS-120	
R55	390Ω		60B8-391	BTS-390	
R56	47KΩ		60B8-473	BTS-47K	
R57	10KΩ		60B8-103	BTS-10K	
R58	10KΩ		60B8-103	BTS-10K	
R59	4. 7Meg		60B8-475	BTS-4. 7Meg	
R60	470KΩ		60B8-474	BTS-470K	
R61	470Ω		60B8-471	BTS-470	

Note 1. Later versions use a 15Meg ½W
Note 2. Not used in some versions.
Note 3. Early versions use a 2. 2Meg ½
Note 4. Early versions use a 220KΩ ½W
Note 5. Early versions use a 470KΩ ½W
† Items R70, C60A, C60B are combined i
♦ Items R80A, R80B, R80C, C63A, C63B

TUBES (GENERAL ELECTRIC, SYLVANIA)

ITEM No	USE	TYPE	NOTES
V1	RF Amplifier	6BC8	
V2	Mixer-Oscillator	6J8	
V3	1st. Video IF Amplifier	6BZ6	
V4	2nd. Video IF Amplifier	6BZ6	
V5	3rd. Video IF Amplifier- Video Detector	6AM6	
V6	Video Output- Sync Phase Inverter	6AW8	
V7	AGC Keying-Vert. Mult.	6BH8	
V8	Sound IF Amplifier	6AU6	
V9	Ratio Detector	6AL5	

ITEM No	USE	TYPE	NOTES
V10	RF Amplifier	6AV8	
V11	Audio Output	6BF5	
V12	Sync Separator	6C86	
V13	Vert. Mult.-Vert. Output	6AV6GT	
V14	Horiz. AFC	6AL5	
V15	Horiz. Mult.	12AU7	
V16	Horiz. Output	6CD6G	
V17	Damper	6AU4GT	
V18	RV Rectifier	1B3GT	
V19	LV Rectifier	5U4GA	

PICTURE TUBE

ITEM No	REPLACEMENT DATA				NOTES
	ADMIRAL Part No.	CBS Part No.	GENERAL ELECTRIC Part No.	SYLVANIA Part No.	
V20	24AP4 ①	21RP4 ①	21RP4 ①	21RP4 ②	① Aluminized ② Silver screen "86"

ELECTROLYTIC CAPACITORS

ITEM No	RATING		REPLACEMENT DATA						
	CAP	VOLT	ADMIRAL Part No	AEROVOX Part No.	CORNELL-DUBILIER Part No.	MALLORY Part No.	PYRAMID Part No.	SANGAMO Part No.	SPRAGUE Part No.
C1A	20	350	67DH5-32	E4D67S	C1M4	FP268-3	TM-8040230-480	Q-157	R2106
B	20	200			BR3035	TC55	TD-100-50		
C	20	350							
D	150	50							
C2A	100	350	67DH5-105	E4C832		FP330-9	TM-3146	Q-321.5	R2056
B	60	350				TC65		MT-3930	
C	130	300							
C3	4	50	67T37-3	BRE50V5	BR84-50	TC30	TD-4-50	MM2-0505	TVA-1303
C4	40	300	67A4-31	PRS250V40	BR4035	TC38	TD-40-250	FM-2540	TVA-1311
C5	40	300	67A4-19	PRS350V40	BR4035	TC78	TD-40-350	FM-4540	TVA-1511

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING		REPLACEMENT DATA							
	Cap.	VOLT	ADMIRAL Part No.	AEROVOX Part No.	CENTRALAB Part No.	CORNELL-DUBILIER Part No.	ERIE Part No.	MALLORY Part No.	SPRAGUE Part No.	NOTES
C9	1		94D46-84	NPO-S1	TCZ-1	TZ01	NPOA-010	ZT-5S1S	5TCCB-V1	
C7	6.8		94D47-53	NPO-D1S.8	TCZ-6R8	ZO1S	NPOA-6R8	ZT-5S6S	5TCCB-V6S	
C8	6.8		94D47-53	NPO-D1S.8	TCZ-6R8	ZO1S	NPOA-6R8	ZT-5S6S	5TCCB-V6S	
C9	5-10		94D47-71		S3S-10					
C10	900		94C37-90							
C11	9.1		94C37-97	NPO-S1S.2	TCZ-3R3	Z006	NPOA-2R2		5TCCB-V3S	
C12	.5-3		98A45-23		S3S-3		S1S-01-0R5	CT565A		
C13	1000			BPD-001	DD-103	K069	S01-001	DC-531	5HK-D1	
C14	900		94C37-90							
C15	.5-3		98A45-23		S3S-3		S1S-01-0R5	CT565A		
C16	60		94D85-78							
C17	10		94D47-51	NPO-D1S	TCZ-10	Z01S	NPOA-100	ZT-5A1	5TCC-Q1	
C18	10		94D47-51	NPO-D1S	TCZ-10	Z01S	NPOA-100	ZT-5A1	5TCC-Q1	
C19	1000			BPD-001	DD-103	K069	S01-001	DC-531	5HK-D1	
C20	9.3		94D93-74	NPO-D1S.2	TCZ-3R3	Z006	NPOA-3R3		5TCCB-V3S	
C21	120		65C8-56	BPD-00012	DD-121	G044	S1J-131	UC-5313	5GA-T2S	
C22	900		94C37-90							
C23	800		94C37-90							
C24	5000		65C43-1	BPD-005	DD-502	K080	S1J-005	DC-526	5HK-D5	
C25	.33	300							2SE-P33	Note 1
C26	1.5	100	56A1D-3	PZS5N-1.0		CUZ5W1		PT41	5TMC-1S	Note 3
C27	5000		65C43-1	BPD-005	DD-502	K080	S1J-005	DC-526	5HK-D5	
C28	5000		65C43-1	BPD-005	DD-502	K080	S1J-005	DC-526	5HK-D5	
C29	.33	300	54B1S-11					PT5402	2SE-P33	
C30	5000		65C43-1	BPD-005	DD-502	K080	S1J-005	DC-526	5HK-D5	
C31	3.3		65C8-59	NPO-S1S.3	TCZ-3R3	TZ06	NPOA-3R3	ZT-5S3S	5TCCB-V3S	
C32	3.3		65C8-59	NPO-S1S2	TCZ-3.3	TZ14	NPOE-330	ZT-5S3	5TCC-Q3	
C33	5000		65C43-1	BPD-005	DD-502	K080	S1J-005	DC-526	5HK-D5	
C34	5000		65C43-1	BPD-005	DD-502	K080	S1J-005	DC-526	5HK-D5	
C35	5000		65C43-1	BPD-005	DD-502	K080	S1J-005	DC-526	5HK-D5	
C36	10000			BPD-01	DD-103	K082	S1J-01	DC-511	5HK-B1	
C37	5000		65C43-1	BPD-005	DD-502	K080	S1J-005	DC-526	5HK-D5	
C38	5000		65C43-1	BPD-005	DD-502	K080	S1J-005	DC-525	5HK-D5	
C39	5000		65C43-1	BPD-005	DD-502	K080	S1J-005	DC-525	5HK-D5	
C40	6.8		65B2S-06S	NPO-S1S.8	TCZ-6R8	TZ08	NPOA-6R8	ZT-5S6S	5TCCB-V6S	
C41	6.8		65B2S-06S	NPO-S1S.8	TCZ-6R8	TZ08	NPOA-6R8	ZT-5S6S	5TCCB-V6S	
C42	.33	400	54B1S-38					PT5403	4SE-P33	
C43	.0068	600	54B9-14	BPD-0068	DS-682	CUBD6S	GP3-333-682		5TMC-D6S	
C44	.01	600	54B9-10	BPD-01	DS-103	CUBD1S	GP3-333-103	PT611	5TM-D1	
C45	.01	600	54B9-13	BPD-01	DS-103	CUBD1S	GP3-333-103	PT611	5TM-D1	
C46	.33	200	54B1S-51					PT5402	2SE-P33	Note 3
C47	.47	200	54B1S-49						2SE-P47	Note 4
C48	10		65C8-44	S1U	D6-100	TP09	GPUK-100	UC-541	5GA-Q1	
C49	20		65C8-51	NPO-S1S0	TCZ-20	TZ15	NPOK-200	ZT-543	5TCC-Q3	
C50	5000		65C43-1	BPD-005	DD-502	K080	S1J-005	DC-525	5HK-D5	
C51	150		65D2S-52							
C52	500		65C39-3	S1U500	D6-501	TP47	GPUK-501	UC-535	5GA-T5	
C53	470		65D2S-70	BPD-00047	DD-471	K060	S1J-471	UC-5347	5GA-T47	Note 5
C54	.0047	600	54B1S-38	BPD-0047	DD-472	K079	S1J-0047	PT5434	4SE-D47	
C55	1000			BPD-001	DD-103	K069	S01-001	DC-531	5HK-D1	Notes 3, 5
C56	.0047	600	54B1S-38	BPD-0047	DD-472	K079	S1J-0047	PT5434	4SE-D47	
C57	50	600	65B2S-10	S1Q50	D6-500	TP50	GPUK-500	UC-545	5GA-Q5	
C58	.01	600	54B1S-36	BPD-01	DD-103	K082	S1J-01	PT5411	4SE-S1	
C59	.0047	600	54B1S-15	BPD-0047	DD-472	K079	S1J-0047	DC-525	5HK-D47	
C59A	150		1PA459	1PC-1S4 (	TP56	GPUK-151		UC-5315	5GA-T15	
B	10000					K083	S1J-01	DC-511	5HK-S1	
C61	.22	200	54B1S-51					PT5402	2SE-P22	
C62	5000		65C43-1	BPD-005	DD-502	K080	S1J-005	DC-525	5HK-D5	
C63A	2000							DC-532		
B	5000			●S3C9-1	●PA-110	●PC-100	●1S2TM2	●14 05-01	●V-1	
C	5000							DC-525		
C64	2200	500	65B2I-322	1484-0023			1RSD29		MS-322	
C65	.047	200	54B1S-32	BPD-05	DF-503			PT5414?	2SE-S47	
C66	.068	600	54B1S-51						4SE-S68	
C67	.1	600	54B2S-7		DF-104				5SE-P1	
C68	.001	1600	54A2-28							
C69	.001	600	54A2-28	SID00	D6-102	CUBD1	GP2L-102	PT621	5TM-D1	
C70	.001	400	54B2I-1	SID00	D6-102	CUBD1	GP2L-102	PT621	5TM-D1	
C71	.001	400	54B2I-1	SID00	D6-102	CUBD1	GP2L-102	PT621	5TM-D1	
C72	.0047	600	54B1S-38	BPD-0047	DD-472	K079	S1J-0047	PT5434	4SE-D47	
C73	.015	300	54B1S-58	BPD-015	DD15-153	K019	S17-015		2SE-S15	

PARTS LIST AND DESCRIPTIONS

CAPACITORS (cont)

ITEM No	RATING		REPLACEMENT DATA						NOTES
	CAP	VOLT	ADMIRAL Part No.	AEROVOX Part No.	CENTRALAB Part No.	CORNELL-DUBILIER Part No.	ERIE Part No.	MALLORY Part No.	SPRAGUE Part No.	
C74	3900	500	65B2I-392		1464-0039		1RSD39		MC8463	M3-239	
C75	390	500	65B2L-391		1469-00039	D6-581	5R5T39	61L-391	MC8243	M3-339	
C76	680	500	65B2L-681		1464-00068	D6-681	1R5T68	61L-681		M3-368	
C77	.0047	600	54B9-15		S14700	D6-472	CUBD4S7	GP2-333-472	PT5247	5TM-D47	Note 2
C78	.047	600	54B9-9		BPD-05	DF-503	CUBS647		PT5147	5TM-S47	
C79	.047	600	54A2-14								
C80	.047	500	54A2-14								
C81	.001	600	54A2-28		1464-001		1RSD1	61L-102	MC8255	M3-21	
C82	.0022	600	54B6-17		S12300		CUBD22	GP2-333-222	PT5222	5TM-D22	
C83	100	3000	65D10-77								

Note 1. Not used in early versions. Other versions may use .47MFD in this application (part #64B16-49).
Note 2. Not used in some versions.
Note 3. Early versions use .1MFD in this application (part #64B16-53).
Note 4. Not used in early versions.
Note 5. Early versions use .0022MFD in this application (part #65D10-89).
Note 6. Some versions use 10000MMF in this application (part #65D10-9).
† Items C59A, C69B and R70 are combined in one unit.
● Items C63A, C63B, C63C, R80A, R80B and R80C are combined in one unit.

CONTROLS

ITEM No	RATING		REPLACEMENT DATA				INSTALLATION NOTES
	RESISTANCE	WATTS	ADMIRAL Part No.	CENTRALAB Part No.	CLAROSTAT Part No.	IRC Part No.	MALLORY Part No.	
R1A	1000Ω	½	73H11-38	P1-5	RTV-853	* QJ-884	US646	Contrast (Panel)
B	1Meg	½		S1-54				Volume (Rear)
C	Switch			KB-1				Attach to R1B.
R2A	2Meg	½	73C13-54	B-76	A47-23Meg-Z	Q13-129	U-55	Tone - Note 1
B	Shaft		Not Req.	Not Req.	KS8-3	Not Req.	Not Req.	Attach to R2A.
R3A	200KΩ	½	73C13-53	B-65	A47-200K-S	Q11-129	U-53	Vert. Hold
B	Shaft		Not Req.	Not Req.	KS8-3	Not Req.	Not Req.	Drill new mounting hole(s).
R4A	100KΩ	½	73C13-52	B-60	A47-100K-S	Q11-128	U-51	Brightness
B	Shaft		Not Req.	Not Req.	KS8-3	Not Req.	Not Req.	Attach to R4A.
R5A	2.5Meg	½	73C2U-1	BX-83	A47-2.5Meg-S	Q11-239	SU-565	Height
B	Shaft		Not Req.	Not Req.	FKS-J	NQ	Not Req.	Attach to R5A.
R6A	3000Ω	3	73C13-56		A43-3000	WF8-3000	R3000J	Vert. Linearity - Wire wound
B	Shaft		Not Req.		FKS-J4	Not Req.	Not Req.	Attach to R6A.
R7A	5Meg	½	73C3U-38	AB-67	A47-5Meg-S	Q11-141	TA56L	Noise Gate
B	Shaft		Not Req.		AK-1	FKS-J	Not Req.	Attach to R7A.

Note 1. Not used in some versions.
Concentrikit Equivalent; K-7 Kit, Base Elements and Shafts; R1-109 & P17-300 (Panel)
R15-137 & R2-318 (Rear)
76-1 (Switch)

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING		REPLACEMENT DATA		NOTES
	OHMS	WATT	ADMIRAL Part No.	IRC Part No.	
R8	680Ω		60B6-684	BTS-680K	
R9	4700Ω		60B8-472	BTS-4700	
R10	5600Ω		60B8-564	BTS-560E	
R11	330KΩ		60B8-334	BTS-330K	
R12	220KΩ		60B8-234	BTS-220K	
R13	12KΩ		60B8-123	BTS-12K	
R14	10KΩ		60B8-103	BTS-10K	
R15	82KΩ		60B8-823	BTS-82K	
R16	8200Ω		60B8-822	BTS-8200	
R17	8.2Meg		60C38-825	BTS-8.2Meg	Note 1
R18	4750Ω		60C38-475	BTS-4.75Meg	
R19	3300Ω	2	60B20-332	BTS-3300	
R20	15KΩ	2	60B20-153	BTS-15K	
R21	1000Ω		60C38-102	BTS-1000	Note 2
R22	1000Ω		60C38-102	BTS-1000	
R23	133KΩ	5%	60C38-133		
R24	1000Ω		60C38-102	BTS-1000	
R25	27KΩ		60C38-273		
R26	180Ω		60C41-180	BTS-56	
R27	220KΩ		60C38-224		
R28	37KΩ		60C38-373	BTS-37K	
R29	10KΩ	5%	60C37-103	BTS-10K 5%	
R30	1000Ω		60C38-102	BTS-1000	
R31	470		60C41-470	BTS-47	
R32	220KΩ		60C38-224		
R33	1000Ω	2	60C38-102	BTS-1000	
R34	10KΩ	2	60B20-103	BTS-10K	
R35	8200Ω		60C38-822	BTS-8200	
R36	1200Ω		60C38-122	BTS-1200	
R37	4700Ω		60C38-472	BTS-4700	
R38	1000		60C38-102	BTS-1000	
R39	47KΩ		60C38-473	BTS-47K	
R40	4700Ω	2	60B20-472	BTS-4700	
R41	82000Ω	2	60C38-822	BTS-8200	
R42	470Ω		60B8-471	BTS-470	
R43	180KΩ		60C38-184	BTS-180K	
R44	10KΩ		60B8-583	BTS-56K	
R45	2700Ω		60B8-272	BTS-2700	
R46	270KΩ		60B8-274	BTS-270K	
R47	390KΩ		60C38-394	BTS-390K	
R48	680KΩ		60B8-684	BTS-680K	
R49	6800Ω		60C38-682	BTS-6800	
R50	2.5Meg		60C38-225	BTS-2.5Meg	
R51	150KΩ		60C38-154	BTS-150K	
R52	470KΩ		60B8-474	BTS-470K	
R53	100Ω		60B8-102	BTS-1000	
R54	120Ω		60B8-121	BTS-120	
R55	390Ω		60B8-391	BTS-390	
R56	47KΩ		60B8-473	BTS-47K	
R57	10KΩ		60B8-103	BTS-10K	
R58	10KΩ		60B8-103	BTS-10K	
R59	4.7Meg		60B8-475	BTS-4.7Meg	
R60	470KΩ		60B8-474	BTS-470K	
R61	470Ω		60B8-471	BTS-470	

ITEM No.	RATING		REPLACEMENT DATA		NOTES
	OHMS	WATT	ADMIRAL Part No.	IRC Part No.	
R62	27KΩ	1	60B14-273	BTA-27K	
R63	2Meg 5%		60B7-205	BTS-2Meg 5%	
R64	100Ω		60B8-101	BTS-100	
R65	1.5Meg 5%		60B7-165	BTS-1.5Meg 5%	
R66	220Ω	1	60B20-221	BTA-220	
R67	220Ω		60B8-221	BTS-220	
R68	470KΩ		60C38-474	BTS-470K	
R69	15KΩ		60C38-153	BTS-15K	
R70	270KΩ		60C38-274	BTS-270K	
R71	1.5Meg		60C39-185	BTS-1.5Meg	
R72	120KΩ		60C39-124	BTS-120K	
R73	56KΩ		60C38-563	BTS-56K	
R74	22KΩ	2	60B20-223	BTS-22K	
R76	4.7Meg		60C38-475	BTS-4.7Meg	
R76	5600Ω		60C38-882	BTS-5600	
R77	33000Ω		60C38-333	BTS-33K	
R78	2.2Meg		60C39-225	BTS-2.2Meg	
R79	3300Ω		60C38-332	BTS-3300	
R80A	22KΩ			BTS-22K	
B	8200Ω				
C	18000Ω				
R81	220KΩ		60C38-224	BTS-220K	
R82	1.5Meg		60C39-155	BTS-1.5Meg	
R83	47KΩ		60C39-473	BTS-47K	
R84	1.5Meg		60C38-155	BTS-1.5Meg	Note 3
R85	100Ω		60B6-101	BTS-100	
R86	22KΩ		60B8-223	BTS-22K	
R87	220KΩ		60B8-224	BTS-220K	
R88	91KΩ 5%	1	60B14-913	BTA-91K 5%	
R89	915Ω 5%	1	60B13-913	BTA-915 5%	
R90	220Ω	1	60B14-221	BTA-220	
R91	470Ω		60B14-471	BTA-470	
R92	270KΩ		60B8-274	BTS-270K	Note 4
R93	390KΩ		60B8-394	BTS-390K	Note 5
R94	560Ω		60B8-561		
R95	560Ω		60B8-561		
R96	100KΩ	5%	60C37-104		
R97	100KΩ	5%	60C37-104		
R98	470KΩ		60C38-474		
R99	4.7Meg		60C38-475		
R100	5600Ω		60C38-562		
R101	150KΩ		60C38-153		
R102	150KΩ		60C38-154		
R103	33KΩ		60C38-333		
R104	5600Ω		60C38-562		
R105	68KΩ	1	60B14-683		
R106	1000Ω		60B8-102		
R107	470KΩ		60B8-474		
R108	100Ω		60B8-101		
R109	18KΩ	2	60B20-183		
R110	1200Ω	2	60B20-122		
R111	12000Ω		60B8-123		
R112	3.9Ω		60B2S-53	BW1-3.9	

Note 1. Later versions use a 15Meg ½W resistor in this application (Part No. 60C38-156).
Note 2. Not used in some versions.
Note 3. Early versions use a 2.2Meg ½W resistor in this application (Part No. 60C38-225).
Note 4. Early versions use a 220KΩ ½W resistor in this application (Part No. 60B8-224).
Note 5. Early versions use a 470KΩ ½W resistor in this application (Part No. 60B8-474).
† Items R70, C60A, C60B are combined in one unit.
● Items R80A, R80B, R80C, C82A, C82B, C82C are combined in one unit.

TRANSFORMER (POWER)

ITEM No.	RATING			REPLACEMENT DATA					NOTES
	PRI.	SEC. 1	SEC. 2	SEC. 3	ADMIRAL Part No	Halldorson Part No	Merit Part No	Stancor Part No	Thordarson Part No.	Triad Part No
T1	117VAC 50-60	575VCT @ 0.8A	5V @ 3A	6.3V @ 12A	80C35-8	P9999 ①	P2836 ②			R-81BC ③

① Taps 240VCT, 230VCT and 370VCT windings, also taps 5V ② 6A winding. Parallel and phase all 6.3V windings.
② Parallel and phase 6.3V ③ winding.
③ Parallel and phase 6.3V ② 6A windings. Taps 6.3V ② 1.3A windings.

TRANSFORMERS (SWEEP CIRCUITS)

ITEM No	USE	REPLACEMENT DATA							
		ADMIRAL Part No.	Halldorson Part No	Merit Part No	RCA TYPE No	Stancor Part No	Thordarson Part No.	Triad Part No
T2	Horiz. Output Trans.	76D85-3	FB430 & RF800 ① 2	HVO-54 ① 2	X-129 ① 2	A-8258 ① 2	FLY-76 ① 2	D-49 ① 2
T3	Vert. Output Trans.	76D43-8	Z1900 ② ③	A-3036 ②	V307 ③	A-8144 ③	26S73	A-99X ③
T4A	Yoke(90° Horiz.(19MM)	94D87-9 ③	DF907 ③	MDF-92 ③	235D1 ③	DY-18A ③	Y-16 ③	Y-41-1 ③
B	Vert. (40MM)	94D87-10 ③						
T5	Width Coil	94A56-2		MWC-10		20LR17 ③	WC-24 ③	
T6	Horiz. Linearity Coil	94A98-1	RF800 ⑪	MWC-8	215R1 ③	20LR15 ③	WC-8 ③	WC-12 ③

① Requires 2 turns of filament winding.
② Connect horizontal damping network across yoke terminals #3 and #7.
③ Connect as auto transformer.
④ Use 2 to 1 turns ratio.
⑤ Includes resistors R94 and R95 and yoke plug Admiral Part No. 88A18-3.
⑥ Alternate deflection yoke part number.
⑦ Connect horizontal damping network across yoke terminals #2 and #7.
⑧ Remove white, black, and red wires going to original coil. Connect common terminal of 20LR17 to terminal #2 of horizontal output transformer. Connect blue wire of original coil to low inductance (series) coil terminal, connect high inductance (parallel) coil terminal to terminal #1 of horizontal output transformer.
⑨ Drill new mounting hole(s).
⑩ Use original slug.
⑪ Use terminals #3 and #4.
⑫ Use blue and red terminals.

*HORIZONTAL OUTPUT TRANSFORMER CONNECTION DATA

Use Original Width Coil Unless Replacement Type Is Listed

ORIGINAL TERMINAL CONNECTIONS	Halldorson Replacement Connections	Merit Replacement Connections	RCA Replacement Connections	Ram Replacement Connections	Stancor Replacement Connections	Thordarson Replacement Connections	Triad Replacement Connections
5	5	5	5	5	5	5	5
4	3	8	4	4	4	4	8
3	NC See Note ⑩	NC See Note ⑩	NC See Note ⑩	NC See Note ⑩	NC See Note ⑩	NC See Note ⑩	NC See Note ⑩
2	See Note 1 ⑭	2	2	2	2	2	1
1	1	1	1	1	1	1	2
7	Term. #2 of RF800 ⑬	7	7	7	7	7	3
8	Term #1 of RF800	8	8	8	8	8	4
Connect Width Coil Across Terminals	Terms #3 & #4 of RF800 Across Term #3 & #4 ⑬						
Special Notes	⑫⑬⑭	⑬	⑬	⑬	⑬	⑬	⑬

⑬ Connect horizontal damping network, capacitor C83 in series with resistor R111 between yoke terminals 3 and 7.
⑭ Remove original width coil and resistor R110. Connect yoke return lead from socket terminal 1 to transformer terminal #1.
⑮ If AGC and AFC do not function properly reverse either primary or secondary of RF800.

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE		REPLACEMENT DATA					NOTES
	PRI.	SEC.	ADMIRAL Part No.	Halldorson Part No	Merit Part No	Stancor Part No	Thordarson Part No	Triad Part No
T7	2.6KΩ	3-4Ω	Part of spkr. 76B108-1	Z1101 ①	A3025 ①	A3333 ①	26S58 ①	S-12X ①

1. Bend ears down to fit mounting bracket.

SPEAKER

ITEM No.	RATINGS				REPLACEMENT DATA			NOTES
	SIZE	FIELD	V. C. IMP.		ADMIRAL Part No.	QUAM Part No.	RCA TYPE No	
SP1	10"	PM	3-4Ω		76B108-1		216D1	

COILS (RF-IF)

ITEM No.	USE	DC RES.		REPLACEMENT DATA				NOTES
		PRI.	SEC.	ADMIRAL Part No.	MEISSNER Part No.	MERIT Part No.	MILLER Part No.	
L1	Ant. Matching Trans.	0Ω	0Ω					
L2	Trans. Matching Trans.	0Ω	0Ω					
L3	IF Trap	.5Ω		94D92-67				
L4A	Ant., RF, Mixer Grid, Osc. Coils	0Ω		94D92-52				Channel 2
B	Ant., RF, Mixer Grid, Osc. Coils	0Ω		94D92-53				Channel 3
C	Ant., RF, Mixer Grid, Osc. Coils	0Ω		94D92-54				Channel 4
D	Ant., RF, Mixer Grid, Osc. Coils	0Ω		94D92-55				Channel 5
E	Ant., RF, Mixer Grid, Osc. Coils	0Ω		94D92-56				Channel 6
F	Ant., RF, Mixer Grid, Osc. Coils	0Ω		94D92-57				Channel 7
G	Ant., RF, Mixer Grid, Osc. Coils	0Ω		94D92-58				Channel 8
H	Ant., RF, Mixer Grid, Osc. Coils	0Ω		94D92-59				Channel 9
I	Ant., RF, Mixer Grid, Osc. Coils	0Ω		94D92-60				Channel 10
J	Ant., RF, Mixer Grid, Osc. Coils	0Ω		94D92-61				Channel 11
K	Ant., RF, Mixer Grid, Osc. Coils	0Ω		94D92-62				Channel 12

ADMIRAL CHASSIS 20Y4D

PARTS LIST AND DESCRIPTIONS (Continued)

COILS (cont)

ITEM No.	USE	DC RES.		REPLACEMENT DATA				NOTES
		PRI.	SEC.	ADMIRAL PART No.	MEISSNER PART No.	MERIT PART No.	MILLER PART No.	
L	Ant., RF, Mixer Grid, Osc. Coils	0Ω		94D92-63				Channel 13
L5	Fil. Choke	0Ω						
L6	Neut. Coil	0Ω						
L7	RF Coil	0Ω		94D92-69				
L8	Conv. Plate	.7Ω		94D92-64				
L9A	27.25MC Trap	.1Ω		72C132-5				
B	1st Video IF	.1Ω		72C132-6				Includes resistor and cap.
L10	2nd Video IF	.4Ω	.4Ω	72C132-4				
L11	21.25MC Trap	.1Ω		72C132-3				
L12	3rd Video IF	.4Ω	.4Ω	72C132-2				
L13	4th Video IF	.7Ω	.3Ω	72B152-2				Includes .005 Cap.
L14	Series Peaking Coil	3.7Ω		73A24-2	19-3036	TV-180	6176	
L15	Series Peaking Coil	5.3Ω		73B5-26	19-3180 *	TV-184 *	6180 *	188 Microhenries, Wound on 4.7KΩ resistor
L16	Shunt Peaking Coil	17Ω		73B5-25	19-3500		6174	505 Microhenries
L17	4.5MC Trap	4.8Ω		72C132-1				
L18	Series Peaking Coil	6.5Ω		73B5-14	19-3250 ■	TV-185 ■	6181 ■	254 Microhenries; Wound on 18KΩ resistor
L19	Shunt Peaking Coil	23Ω		73A11-1			6156 ▲	79 Microhenries; Wound on 10KΩ resistor
L20	Sound IF	4.8Ω		72C132-1				
L21	Ratio Det.	3.7Ω	.3ΩCT	72C68-4				Tertiary Winding=.4Ω

* Parallel with 4.7KΩ resistor.
■ Parallel with 18KΩ resistor.
▲ Parallel with 10KΩ resistor.

TRANSFORMER (HORIZ. OSC.)

ITEM No.	DC RES.		REPLACEMENT DATA							NOTES
	PRI.	SEC.	ADMIRAL PART No.	MEISSNER PART No.	MERIT PART No.	MILLER PART No.	RCA TYPE No.	Ram PART No.	Thordarson PART No.	
L22	55Ω		94C17-4							

FILTER CHOKE

ITEM No.	RATINGS			REPLACEMENT DATA					
	TOTAL DIRECT CURRENT	D.C. RESISTANCE	INDUCTANCE (0 CURRENT 1000 ~)	ADMIRAL PART No.	Halldorson PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.
L23	.250A	50Ω	1.5HY	74B18-14 74B18-13 ①	C5040	C2994	C2327	26C41	C-21X

① Use an alternate.

MISCELLANEOUS

ITEM No.	PART NAME	ADMIRAL PART No.	NOTES
M1	Dial Light	81A1-12	#51-Not used in some versions
M2	Tuner	94D92-7	VHF
M3	Printed Circuit Board	A4861-1	Video IF
M4	Printed Circuit Board	A4863	Sound IF
M5	Printed Circuit Board	A4890	Sync
M6	Focus Magnet	94C53-3	Includes Centering Device
M7	Ion Trap	94A15-3	
B2	Trimmer Cap.	66A30-3	Horiz. Drive (170-780MMF)
	Cabinet	35E349-2	Model C28B6
	Cabinet	35E349-3	Model C28B7
	Knob	33D165-10	Fine Tuning
	Knob	33D165-11	Contrast
	Knob	33D165-64	VHF Channel Selector (Maroon with Gold Trim)
	Knob	33D165-92	VHF Channel Selector (Beige with Gold Trim)
	Knob	33D165-122	VHF Channel Selector (Green with Gold Trim)
	Knob	33D165-65	On-Off-Volume (Maroon with Gold Trim)
	Knob	33D165-93	On-Off-Volume (Beige with Gold Trim)
	Knob	33D165-123	On-Off-Volume (Green with Gold Trim)
	Mask	23E230-5	Model C28B6
	Mask	23E230-3	Model C28B7
	Safety Glass	21C83-10	

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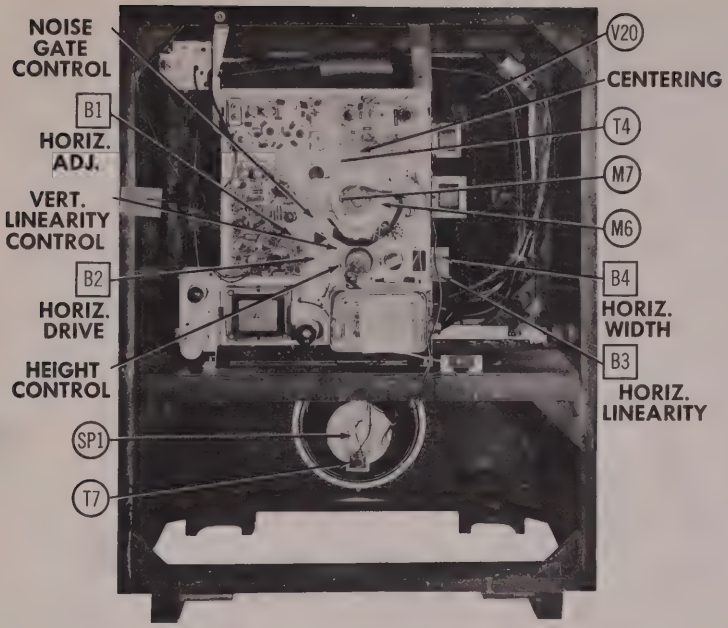
DENVER, COLORADO



CABINET—REAR VIEW

HORIZONTAL SWEEP CIRCUIT ADJUSTMENTS

1. Turn the set on and tune in a TV station, preferably with a test pattern.

2. Set the brightness and contrast control for a normal picture.

3. Turn the horizontal adjustment slug (B1) clockwise until the picture loses sync. It may be necessary to momentarily switch off channel for picture to lose sync.

4. Turn B1 slowly counter clockwise until picture just falls into sync.

5. Turn to an unused channel. If vertical lines appear near the center of the screen, slowly adjust the horizontal drive trimmer (B2) counter clockwise until the white lines disappear.

6. If in step 5 the horizontal drive was adjusted, tune in a station and repeat steps 3 and 4. Check horizontal sync by switching off channel and back again.

7. Adjust horizontal linearity slug (B3) for a picture that is symmetrical from left to right.

8. Adjust width slug (B4) for a picture slightly wider than necessary to fill the picture mask horizontally.

PROPERTY OF
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3924 [illegible]
DENVER, COLORA[illegible]

AIRLINE
MODEL GSL-1575A

AIRLINE
MODEL GSL-1575A

TRADE NAME	Airline Model GSL-1575A
SUPPLIER	Montgomery Ward & Co., 619 Chicago Ave., Chicago, Ill.
TYPE SET	AC Operated AM Superheterodyne Receiver With Electric Clock
TUBES (Four)	Types 12AU6 Converter, 12AV6 Det.-AF Amp., 50C5 Output, 35W4 Rectifier
POWER SUPPLY	110-120 Volts AC-60 Cycles — RATING .22 Amp. @ 117 Volts AC
TUNING RANGE—BROADCAST	540KC-1600KC

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

Volume control should be at maximum position. Output of signal generator should be no higher than necessary to obtain an output reading. Use an insulated alignment screwdriver for adjusting.
Loop should be maintained in same relative position to chassis as when receiver is in cabinet.
Use isolation transformer, if available. If not, connect a .1MFD capacitor in series with low side of signal generator and B-.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
1.	.05MFD	High side to antenna stator lug. Low side to B-.	455KC (400~Mod)	Point of non-interference	Across voice coil	A1, A2	Adjust for maximum output. If isolation transformer is not used, reduce dummy antenna to .001MFD to reduce hum modulation.
2.	"	"	1620KC	Tune to 1620KC signal	"	A3	"
3.		Loop (Radiated)	1400KC	Tune to 1400KC signal	"	A4	Fashion loop of several turns of wire and radiate signal into loop of receiver. Adjust for maximum output.

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PARTS LIST AND DESCRIPTIONS

AIRLINE
Model GSL-1575A

TUBES (GENERAL ELECTRIC, SYLVANIA)

ITEM No.	USE	TYPE	NOTES
V1	Converter	12AU6	
V2	Det.-AF Amp.	12AV6	
V3	Output	50C5	
V4	Rectifier	35W4	

ELECTROLYTIC CAPACITORS

ITEM No.	RATING		REPLACEMENT DATA						
	CAP.	VOLT.	AIRLINE PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SANGAMO PART No.	SPRAGUE PART No.
C1A	40	150	R-1482	PRS150/25V	BBRT4215C	TCT3055	TDL-432	FMT321	TVA-3423
B	20	150		4030/20					
C	20	15							

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING		REPLACEMENT DATA							NOTES
	CAP.	VOLT	AIRLINE PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	
C2	100			BPD-0001	DD-101	G042	801-101	UC-531	5GA-T1	
C3	2		N-9897							
C4	56			NP0-S156	TCZ-56	TZ24	NP0-337-560		5TCC-Q56	
C5	56			NP0-S156	TCZ-56	TZ24	NP0-337-560		5TCC-Q56	
C6A	220									
B	2000									
C	5000		♦R-1487	♦PA-113-1	♦PC-150	♦116TM1	♦1408-01		♦DT-1	
D	250									
E										
C7	10000			BPD-01	DD-103	K082	811-01	DC-511	5HK-S1	
C8	10000			BPD-01	DD-103	K082	811-01	DC-511	5HK-S1	
C9	.047	200	R-1462	BPD-05	DF-503	CUB2S47		PT4147	2TM-S47	

♦ Items C6A, C6B, C6C, C6D, C6E, R3A, R3B, R3C are combined in one unit.
When replacing items separately, C6D and C6E should total 250MMF.

CONTROLS

ITEM No.	RATING		REPLACEMENT DATA					INSTALLATION NOTES
	RESISTANCE	WATTS	AIRLINE PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	IRC PART No.	MALLORY PART No.	
R1A	2Meg	½	R-1861	AB-76	A47-2Meg-Z	Q13-139	U-55	Volume
B	Shaft		Not Req.	AK-4	KSS-3	Not Req.	Not Req.	Attach to R1A

RESISTORS

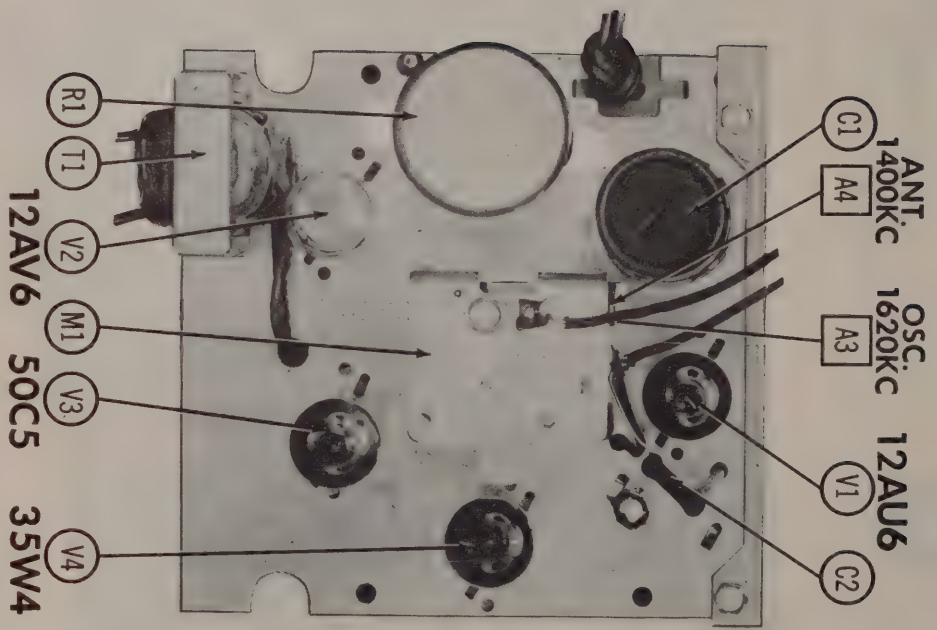
All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING		REPLACEMENT DATA		NOTES
	OHMS	WATT	AIRLINE PART No.	IRC PART No.	
R2	2.7Meg			BTS-2.7Meg	
R3A	6.8Meg			BTS-6.8Meg	
B	470KΩ		♦R-1487	BTS-470K	
C	470KΩ			BTS-470K	

ITEM No.	RATING		REPLACEMENT DATA		NOTES
	OHMS	WATT	AIRLINE PART No.	IRC PART No.	
R4	180Ω			BTS-180	
R5	2200Ω			BTS-2200	
R6	22Ω			BTS-22	
R7	68Ω	2	R-1483		

♦ Items R3A, R3B, R3C, C6A, C6B, C6C, C6D, C6E are combined in one unit.

CHASSIS—TOP VIEW



PARTS LIST AND DESCRIPTIONS (Continued)

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE		REPLACEMENT DATA						NOTES
	PRI.	SEC.	AIRLINE PART No.	Halldorson PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	
T1	2.7KΩ	3-4Ω	R-1841	Z1101 ①	A-3025 ①	A-3332 ①	26S58 ①	S-12X ①	① Bend ears down to fit.

SPEAKER

ITEM No.	RATINGS			REPLACEMENT DATA			NOTES
	SIZE	FIELD	V. C. IMP.	AIRLINE PART No.	QUAM PART No.	RCA TYPE No.	
SP1	3½"	PM	3-4Ω	R-1863	3A07		

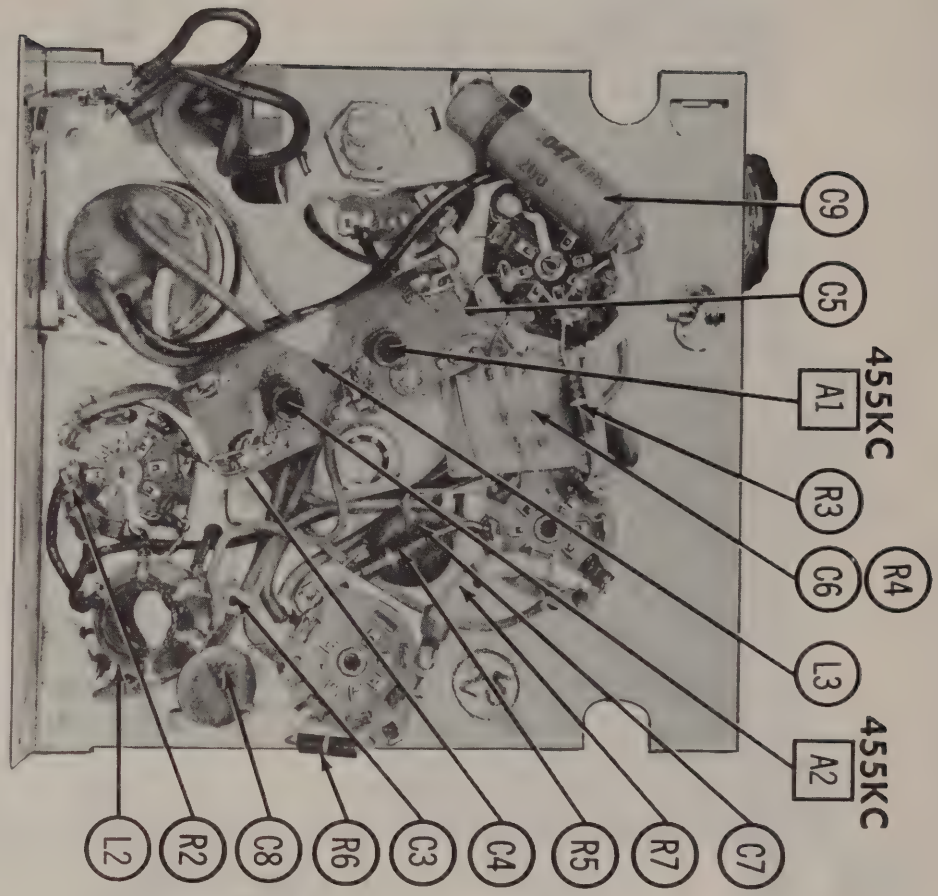
COILS (RF-IF)

ITEM No.	USE	DC RES.		REPLACEMENT DATA				NOTES
		PRI.	SEC.	AIRLINE PART No.	MEISSNER PART No.	MERIT PART No.	MILLER PART No.	
L1	Loop Ant.	3.3Ω		R-1864				Includes cabinet back
L2	Osc. Coil	1.1Ω	7.7Ω	R-1897				Tertiary winding-1.7Ω
L3	IF Trans.	27Ω *	27Ω	R-1898				*Tapped @ 1.1Ω

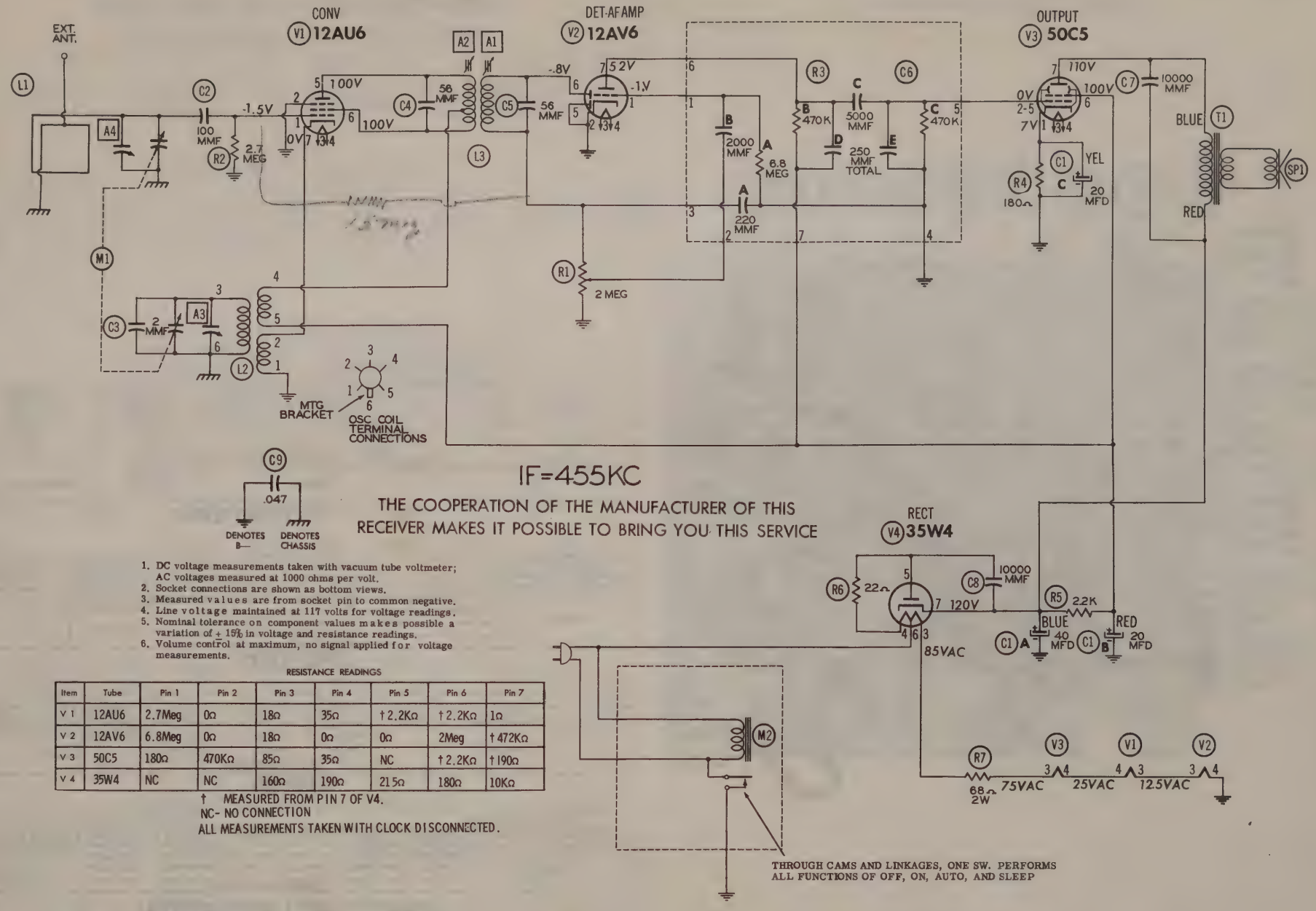
MISCELLANEOUS

ITEM No.	PART NAME	AIRLINE PART No.	NOTES
M1	Tuning Cap.	R-1481	2 Gang (13-290MMF, 11-115MMF)
M2	Clock	R-1862	
	Cabinet	#561	
	Knob	R-1055	Volume
	Knob	R-1835	Tuning
	Knob	N-9783	Clock

CHASSIS—BOTTOM VIEW



AIRLINE Model GSL-1575A



IF=455KC

THE COOPERATION OF THE MANUFACTURER OF THIS RECEIVER MAKES IT POSSIBLE TO BRING YOU THIS SERVICE

1. DC voltage measurements taken with vacuum tube voltmeter; AC voltages measured at 1000 ohms per volt.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance on component values makes possible a variation of ± 15% in voltage and resistance readings.
6. Volume control at maximum, no signal applied for voltage measurements.

RESISTANCE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7
V 1	12AU6	2.7Meg	0Ω	18Ω	35Ω	†2.2KΩ	†2.2KΩ	1Ω
V 2	12AV6	6.8Meg	0Ω	18Ω	0Ω	0Ω	2Meg	†472KΩ
V 3	50C5	180Ω	470KΩ	85Ω	35Ω	NC	†2.2KΩ	†190Ω
V 4	35W4	NC	NC	160Ω	190Ω	215Ω	180Ω	10KΩ

† MEASURED FROM PIN 7 OF V4.
NC- NO CONNECTION
ALL MEASUREMENTS TAKEN WITH CLOCK DISCONNECTED.

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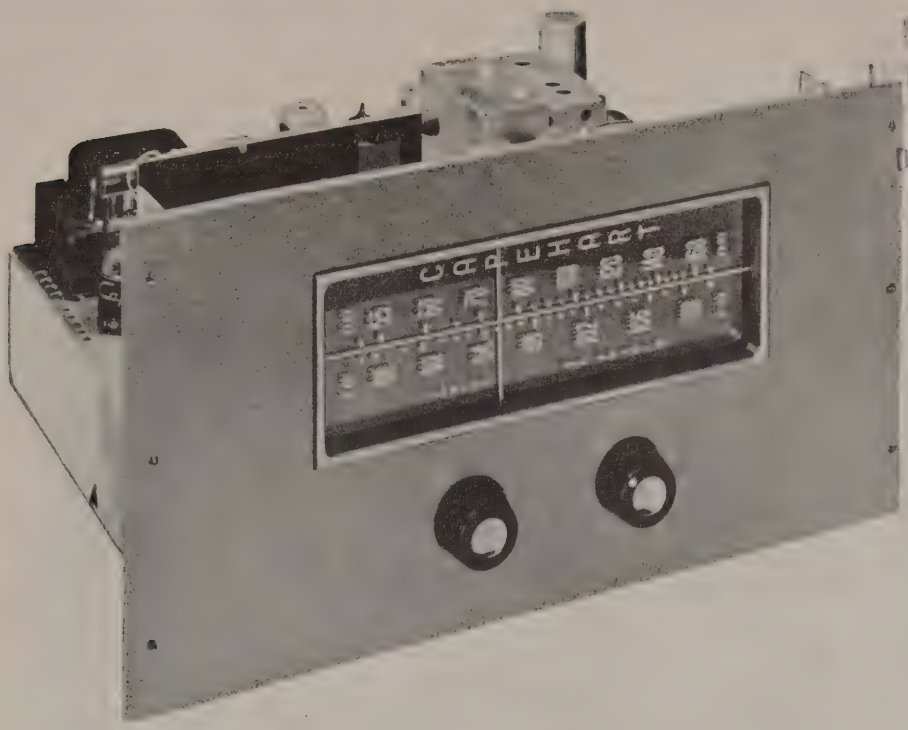
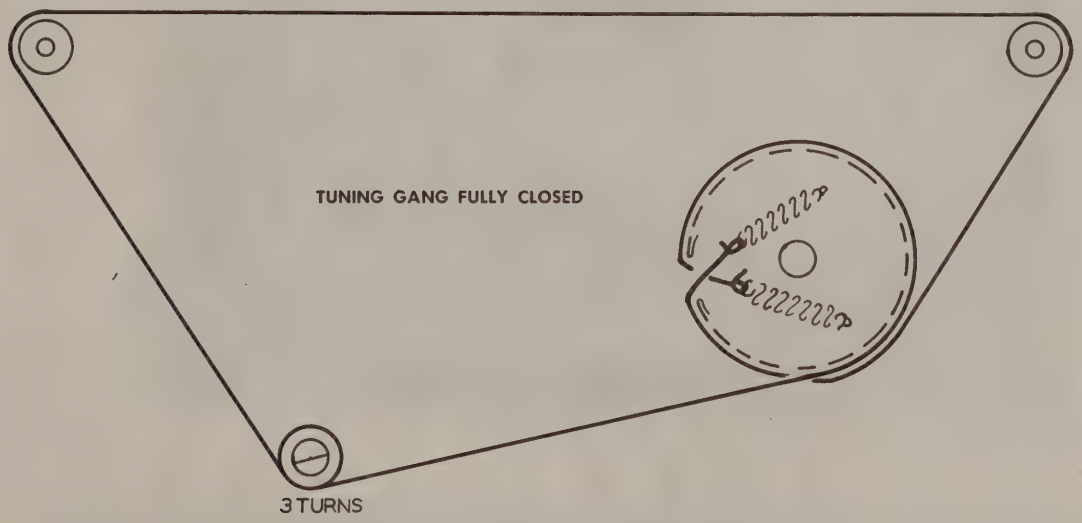


CAPEHART MODELS 19K75, 22K75 (Ch. CR-204)

CAPEHART MODELS 19K75, 22K75 (Ch. CR-204)

TRADE NAME	Capehart Models 19K75, 22K75 (Ch. CR-204)		
MANUFACTURER	Capehart-Farnsworth Corp., Ft. Wayne 1, Ind.		
TYPE SET	AC Operated FM-AM Superheterodyne Tuner		
TUBES	Seven		
POWER SUPPLY	105-125 Volts AC-60 Cycles	RATING	.23 Amp. @ 117 Volts AC
TUNING RANGE-BROADCAST	537KC-1620KC	FREQ. MOD.	88MC-108MC



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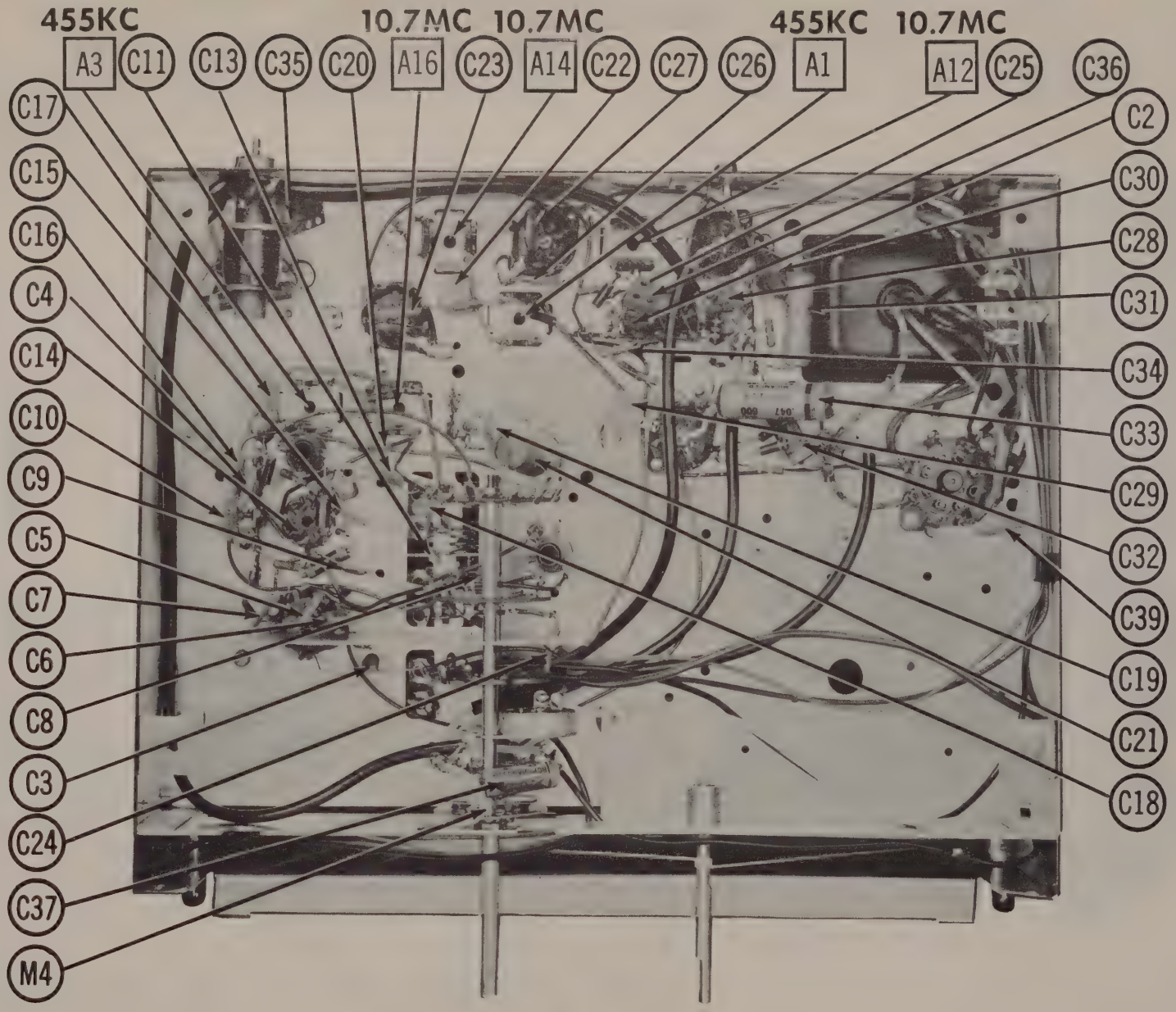
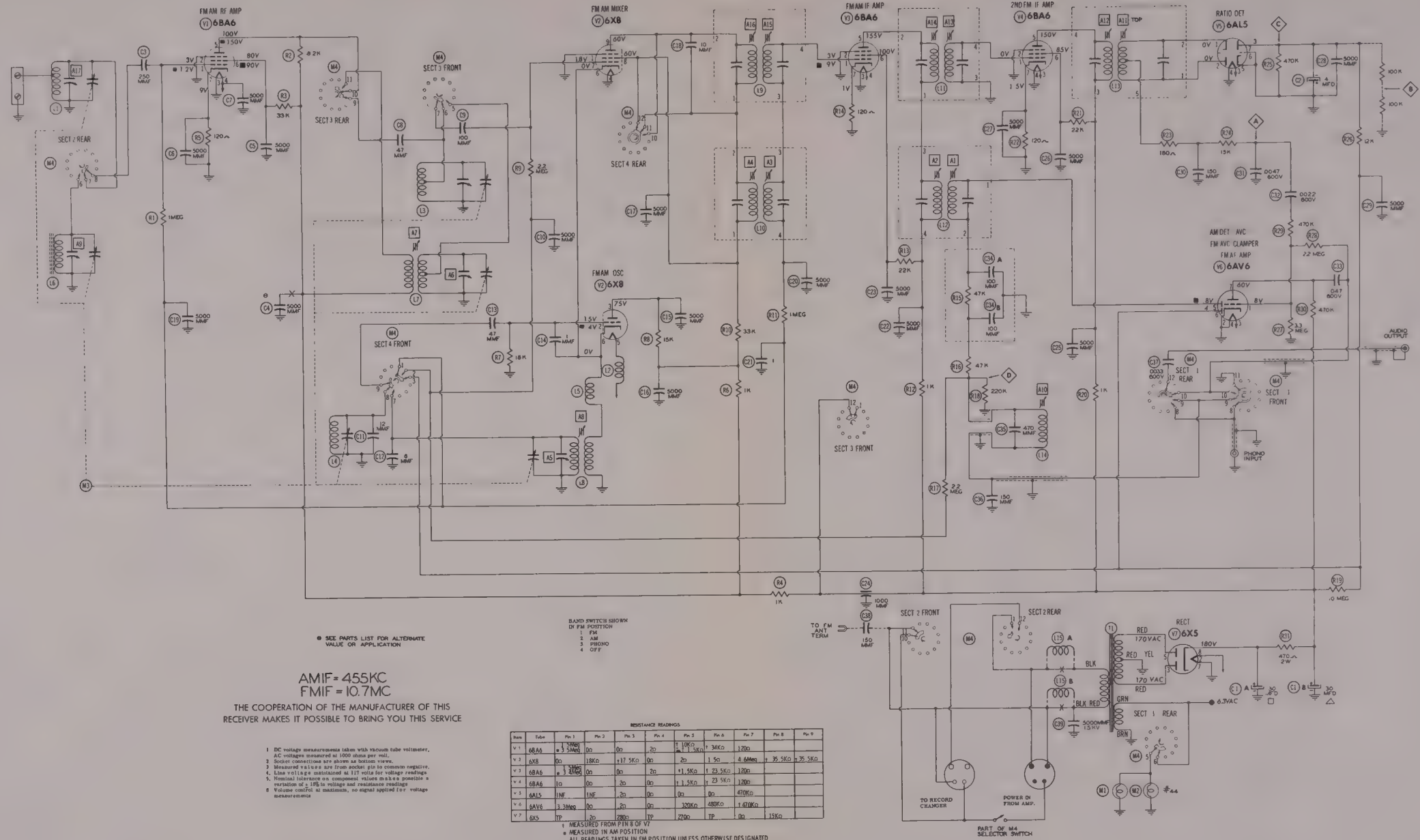


CHASSIS BOTTOM VIEW-CAPACITOR IDENTIFICATION



AMIF = 455KC
FMIF = 10.7MC

THE COOPERATION OF THE MANUFACTURER OF THIS RECEIVER MAKES IT POSSIBLE TO BRING YOU THIS SERVICE

1. DC voltage measurements taken with vacuum tube voltmeter, AC voltages measured at 1000 ohms per volt.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Line voltage maintained at 117 volts for voltage readings
5. Nominal tolerance on component values makes possible a variation of ± 10% in voltage and resistance readings
6. Volume control at maximum, no signal applied for voltage measurements

RESISTANCE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V 1	6BA6	↑ .5Meg ● 3.5Meg	0Ω	0Ω	2Ω	↑ 10KΩ ● 1.5KΩ	↑ 34KΩ	120Ω		
V 2	6X8	0Ω	18KΩ	↑17.5KΩ	0Ω	2Ω	1.5Ω	4.6Meg	↑ 35.5KΩ	↑ 35.5KΩ
V 3	6BA6	↑ .5Meg ● 3.4Meg	0Ω	0Ω	2Ω	↑1.5KΩ	↑ 23.5KΩ	120Ω		
V 4	6BA6	1Ω	0Ω	2Ω	0Ω	↑ 1.5KΩ	↑ 23.5KΩ	120Ω		
V 5	6AL5	1MF	1MF	2Ω	0Ω	0Ω	0Ω	470KΩ		
V 6	6AV6	3.3Meg	0Ω	2Ω	0Ω	320KΩ	480KΩ	↑ 670KΩ		
V 7	6X5	TP	2Ω	280Ω	TP	270Ω	TP	0Ω	15KΩ	

↑ MEASURED FROM PIN 8 OF V7
● MEASURED IN AM POSITION
ALL READINGS TAKEN IN FM POSITION UNLESS OTHERWISE DESIGNATED
TP-TIE POINT

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323-4

CAPEHART
Model 19K15 (Ch. CR-204)

CHASSIS BOTTOM VIEW-RESISTOR IDENTIFICATION

ALIGNMENT INSTRUCTIONS

ALIGNMENT INSTRUCTIONS READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

Volume control should be at maximum position. Output of signal generator should be no higher than necessary to obtain an output reading. Use an insulated alignment screwdriver for adjusting.
Use isolation transformer, if available. If not, connect a .1MFD capacitor in series with low side of signal generator and B-.
To set pointer, turn tuning capacitor fully closed and set pointer to last reference mark at low frequency end of dial.

AM ALIGNMENT

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	BAND SWITCH POS.	RADIO DIAL SETTING	CONNECT VTVM	ADJUST	REMARKS
1.	.01MFD	High side to pin 7 (grid) of 6X8 (V2). Low side to chassis.	455KC (400% Mod.)	AM	Tuning gang fully open	DC probe to point (D). Common to chassis.	A1, A2, A3, A4	Adjust for maximum deflection.
2.	"	High side to antenna stator ing. Low side to chassis.	1630KC	"	"	"	A5	"
3.	"	"	1500KC	"	Tune to 1500KC signal	"	A6	"
4.	"	"	600KC	"	Tune to 600KC signal	"	A7	"
5.	"	"	537KC	"	Tune to 537KC signal	"	A8	"
6.		Loop	1500KC	"	Tune to 1500KC signal	"	A9	"

10KC FILTER ADJUSTMENT

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	BAND SWITCH POS.	RADIO DIAL SETTING	CONNECT VTVM	ADJUST	REMARKS
7.		High side to pin 1 (grid) of 6BA8 (V3). Low side to chassis.	455KC (10KC Mod.)	AM		AC probe to audio output jack. Common to chassis.	A10	Adjust for MINIMUM deflection.

FM IF ALIGNMENT USING AM SIGNAL GENERATOR AND VTVM

Connect two matched 100KΩ (±1%) resistors in series from point (C) to chassis. The junction of these two resistors is alignment point (R) as shown on the schematic.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	BAND SWITCH POS.	RADIO DIAL SETTING	CONNECT VTVM	ADJUST	REMARKS
8.	.01MFD	High side to pin 1 (Grid) of 6BA6 (V4). Low side to chassis.	10.7MC (Unmod.)	FM	Tuning gang fully open	DC probe to point (A). Common to point (B).	A11	Adjust for zero reading. A positive and negative reading will be obtained on either side of the correct setting.
9.	"	"	"	"	"	DC probe to point (C). Common to chassis.	A12	Adjust for maximum deflection.
10.	"	High side to pin 1 (grid) of 6BA6 (V3). Low side to chassis.	"	"	"	"	A13, A14	"
11.	"	High side to pin 1 (grid) of 6BA6 (V1). Low side to chassis.	"	"	"	"	A15, A16	"

FM IF ALIGNMENT USING FM SIGNAL GENERATOR AND OSCILLOSCOPE

Use frequency modulated signal with 80% modulation and 450KC sweep. Use 120% sawtooth voltage in scope for horizontal deflection.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	BAND SWITCH POS.	RADIO DIAL SETTING	CONNECT SCOPE	ADJUST	REMARKS
8.	.01MFD	High side to pin 1 (grid) of 6BA6 (V4). Low side to chassis.	10.7MC (450KC Swp)	FM	Tuning gang fully open	Vert. amp. to point (A). Low side to point (B).	A11	Adjust so that 10.7MC occurs at center of crossover lines similar to Fig. 1.
9.	"	"	"	"	"	Vert. amp. to point (C). Low side to chassis.	A12	Disconnect stabilizing capacitor (C2). Adjust for maximum amplitude and symmetry similar to Fig. 2.
10.	"	High side to pin 1 (grid) of 6BA6 (V3). Low side to chassis.	"	"	"	"	A13, A14	"
11.	"	High side to pin 1 (grid) of 6BA6 (V1). Low side to chassis.	"	"	"	"	A14, A15	Adjust for maximum amplitude and symmetry similar to Fig. 2. Reconnect stabilizing capacitor (C2).

FM RF ALIGNMENT

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	BAND SWITCH POS.	RADIO DIAL SETTING	CONNECT VTVM	ADJUST	REMARKS
12.	270Ω Carbon Resistor	High side thru 270Ω to ungrounded FM antenna terminal. Low side to	106.5MC (Unmod.)	FM	Tuning gang fully open	DC probe to point (D). Common to chassis.	C11	Adjust for maximum deflection by moving C11 nearer to or farther from chassis.
13.	"	"	105MC	"	Tune to 105MC signal	"	A17, A18	Adjust for maximum deflection.
14.	"	"	87.6MC	"	Tuning gang fully closed	"	L4	Adjust for maximum deflection. Adjust for maximum deflection by expanding or compressing coil turns.
15.	"	"	90MC	"	Tune to 90MC signal	"	L3	"

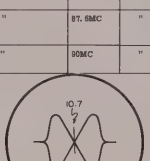


FIG.1

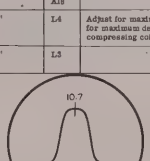


FIG.2

PARTS LIST AND DESCRIPTIONS

TUBES (GENERAL ELECTRIC, SYLVANIA)

ITEM No.	USE	TYPE	NOTES
V1	FM-AM RF Amplifier	6BA6	
V2	FM-AM Mixer-Osc.	6X8	
V3	1st FM-AM IF Amp.	6BA6	
V4	2nd FM IF Amp.	6BA6	

ITEM No.	USE	TYPE	NOTES
V5	Ratio Detector	6AL5	
V6	AM Det. -AM AVC-FM AVC Clamp-FM AF Amp.	6AV6	
V7	Rectifier	6X5	

ELECTROLYTIC CAPACITORS

ITEM No.	RATING CAP.	RATING VOLT.	REPLACEMENT DATA CAPEHART PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SANGAMO PART No.	SPRAGUE PART No.
C1A	■ 30	350	750090B-49	AFH2-83	B031	FP227.3	TMD37	D-340	TVL-2621
B	▲ 30	300							
C2	4	50	650716A-1	SRE50V5	BR550	TC30	TD-4-50	MMT-0505	TVA-1303

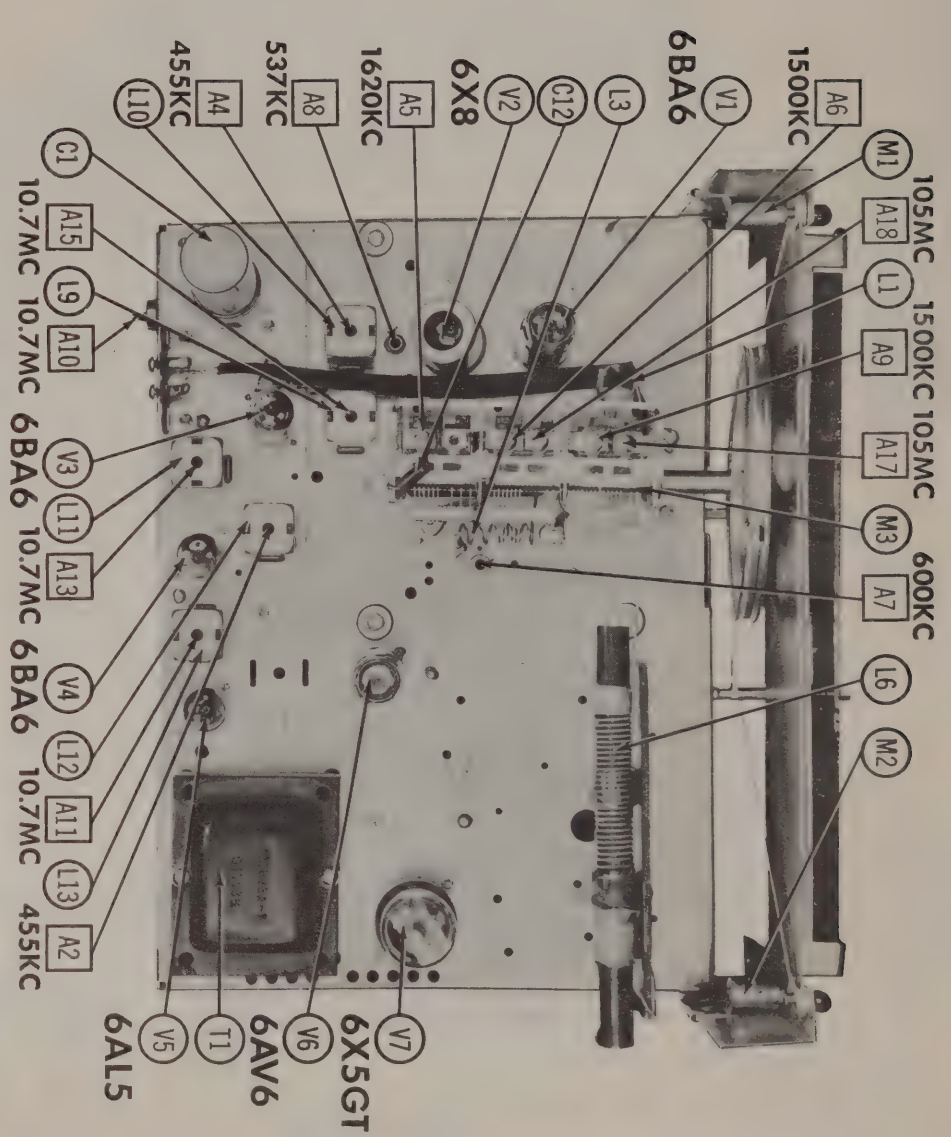
FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING CAP.	RATING VOLT	REPLACEMENT DATA CAPEHART PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	NOTES
C3	250		450469A-9	SI-250	D6-251	G053	811-251	UC-5325	5GA-T25	
C4	5000		450469A-1	BPD-005	DD-502	K080	811-005	DC525	5HK-D5	Note 1
C5	5000		450469A-1	BPD-005	DD-502	K080	811-005	DC525	5HK-D5	
C6	5000		450469A-1	BPD-005	DD-502	K080	811-005	DC525	5HK-D5	
C7	5000		450469A-1	BPD-005	DD-502	K080	811-005	DC525	5HK-D5	
C8	47		2271-0678	N750-SI47	TCN-47	N033	N750K-470	NT-5447	5TCC-Q47	
C9	100		2271-0686	N750-SI100	TCN-100	N046	N750L-101	NT-531	5TCC-T1	
C10	5000		450469A-1	BPD-005	DD-502	K080	811-005	DC525	5HK-D5	
C11	12		2271-5599							
C12	6		650501A-32			Z012				
C13	47		2271-0678	N750-DI47	TCN-47	N033	N750K-470	NT-5447	5TCC-Q47	
C14	1		650501A-27	NPO-SI1	TCZ-1	TZ03	NPOA-010		5TCCB-V1	
C15	5000		450469A-1	BPD-005	DD-502	K080	811-005	DC525	5HK-D5	
C16	5000		450469A-1	BPD-005	DD-502	K080	811-005	DC525	5HK-D5	
C17	5000		450469A-1	BPD-005	DD-502	K080	811-005	DC525	5HK-D5	
C18	10		2271-9467							
C19	5000		450469A-1	BPD-005	DD-502	K080	811-005	DC525	5HK-D5	
C20	5000		450469A-1	BPD-005	DD-502	K080	811-005	DC525	5HK-D5	
C21	.1	400	2246-1040	P488N-1	DF-104	CUB4P1		PT401	4TM-P1	
C22	5000		450469A-1	BPD-005	DD-502	K080	811-005	DC525	5HK-D5	
C23	5000		450469A-1	BPD-005	DD-502	K080	811-005	DC525	5HK-D5	
C24	1000		650716A-1	EF-001	MFT-1000				503C-D1	
C25	5000		450469A-1	BPD-005	DD-502	K080	811-005	DC525	5HK-D5	
C26	5000		450469A-1	BPD-005	DD-502	K080	811-005	DC525	5HK-D5	
C27	5000		450469A-1	BPD-005	DD-502	K080	811-005	DC525	5HK-D5	
C28	5000		450469A-1	BPD-005	DD-502	K080	811-005	DC525	5HK-D5	
C29	5000		450469A-1	BPD-005	DD-502	K080	811-005	DC525	5HK-D5	
C30	150	500	650162A-8	NPO-SI150	TCZ-150	5W5T15	811-151	MC236	1FM-T15	
C31	.0047	600	2248-4720	BPD-0047	D6-472	CUB6D47	GP2-333-472	PT6247	6TM-D47	
C32	.0022	600	2248-2220	BPD-0022	D6-222	CUB6D22	GP2-333-222	PT6222	6TM-D22	
C33	.047	600	2248-4730	BPD-05	DF-503	CUB6S47		PT6147	6TM-S47	
C34A	100		†452171A-1	†PA-97-1	†PC-50	†111TM1	†1403-01	UC-531	† D-1	
B	100							UC-531		
C35	470	500								
C36	150	500	650162A-8	NPO-SI150	TCZ-150	5R5T15	811-151	MCB236	MS-315	
C37	.0033	600	2448-3320	BPD-0033	D6-332	CUB6D33	GP2-333-332	CUB6D33	6TM-D33	
C38	150			HVD-15-150	DD-30-150	VT15	1R5KV-151	MCL315	15GA-T15	Note 1
C39	5000	1500	453521A-1	HVD-15-4700	DD-502	V2D47	1R5KV-472		20HK-D5	

Note 1. Not used in some versions.
† Items C34A, C34B and R15 are combined in one unit.

CHASSIS—TOP VIEW



PARTS LIST AND DESCRIPTIONS (Continued)

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING		REPLACEMENT DATA		NOTES
	OHMS	WATT	CAPEHART PART No.	IRC PART No.	
R1	1Meg		3230-105	BTS-1Meg	
R2	8200Ω		3229-822	BTS-8200	
R3	33KΩ		3230-333	BTS-33K	
R4	1000Ω		3229-102	BTS-1000	
R5	120Ω		3229-121	BTS-120	
R6	1000Ω		3229-102	BTS-1000	
R7	18KΩ		3229-183	BTS-18K	
R8	15KΩ		3229-153	BTS-15K	
R9	2.2Meg		3230-225	BTS-2.2Meg	
R10	33KΩ		3230-333	BTS-33K	
R11	1Meg		3230-105	BTS-1Meg	
R12	1000Ω		3229-102	BTS-1000	
R13	22KΩ		3229-223	BTS-22K	
R14	120Ω		3229-121	BTS-120	
R15	47KΩ		† 472171A-1	BTS-47K	
R16	47KΩ		3230-473	BTS-47K	
R17	2.2Meg		3230-225	BTS-2.2Meg	
R18	220KΩ		3230-224	BTS-220K	
R19	10Meg		3229-106	BTS-10Meg	
R20	1000Ω		3229-102	BTS-1000	
R21	22KΩ		3229-223	BTS-22K	
R22	120Ω		3229-121	BTS-120	
R23	180Ω		3229-181	BTS-180	
R24	15KΩ		3229-153	BTS-15K	
R25	470KΩ		3230-474	BTS-470K	
R26	12KΩ		3229-123	BTS-12K	
R27	3.3Meg			BTS-3.3Meg	
R28	2.2Meg		3230-225	BTS-2.2Meg	
R29	470KΩ		3230-474	BTS-470K	
R30	470KΩ		3230-474	BTS-470K	
R31	470Ω	2	3235-471	BTB-470	

† Items R15, C34A, C34B are combined in one unit.

TRANSFORMER (POWER)

ITEM No.	RATING				REPLACEMENT DATA					
	PRI.	SEC. 1	SEC. 2	SEC. 3	CAPEHART PART No.	Halldorson PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.
T1	117VAC ⓖ .23A	350VCT ⓑ .029A	6.3VAC ⓖ 2.4A		750623A-1	P9303①			22R38	

① Drill new mounting holes.

COILS (RF-IF)

ITEM No.	USE	DC RES.		REPLACEMENT DATA				NOTES
		PRI.	SEC.	CAPEHART PART No.	MEISSNER PART No.	MERIT PART No.	MILLER PART No.	
L1	FM Ant. Coil	0Ω		453383A-1				Tapped
L2	Fil. Choke	.4Ω		452864A-1	19-1003		4608	4 Microhenries
L3	FM RF Coil	0Ω		453382B-1				Tapped
L4	FM Osc. Coil	0Ω		453379B-1				
L5	Cathode Choke	.4Ω		452864A-1	19-1003		4608	4 Microhenries
L6	Loop Stick	.8Ω		453948A-G1				
L7	AM RF Coil	6Ω	3.7Ω *	650727B-1	14-1076			* Tapped at 2.5Ω
L8	AM Osc. Coil	1.1Ω	5.8Ω	650729A-1	14-1074	BC-381	71-Osc.	
L9	1st FM IF	.9Ω	.9Ω	452027A-1	16-3487	FM-254	1463	
L10	1st AM IF	16Ω	16Ω	452243A-1	16-6758	BC-352	12-C1	
L11	2nd FM IF	.9Ω	.9Ω	452027A-1	16-3487	FM-254	1463	
L12	2nd AM IF	12Ω	12Ω	452177A-1	16-6758	BC-353	12-C2	
L13	Ratio Det.	4.2Ω	1.6Ω CT	453712A-1	17-3498	FM-255	1465	Tertiary Winding=.5Ω
L14	10KC Filter	500Ω		650811A-1				
L15A	Line Choke							Not used in some versions.
B	Line Choke							

PARTS LIST AND DESCRIPTIONS (Continued)

MISCELLANEOUS

ITEM No.	PART NAME	CAPEHART PART No.	NOTES
M1	Dial Light	600093A-5	#44
M2	Dial Light	600093A-5	#44
M3	Tuning Cap.	750413A-1	6 Gang (AM Sections: 21-335MMF, 24-305MMF, 19-162MMF)
M4A	Switch	750625A-1	Selector (Rotary, Wafer Type)
B	Switch		On-Off-(SPST)
	Knob	651002B-1	Tuning
	Knob	651002B-2	Selector Switch
	Dial Pointer	452208A-1	
	Dial Glass	750624A-1	

DEWALD MODEL J-543

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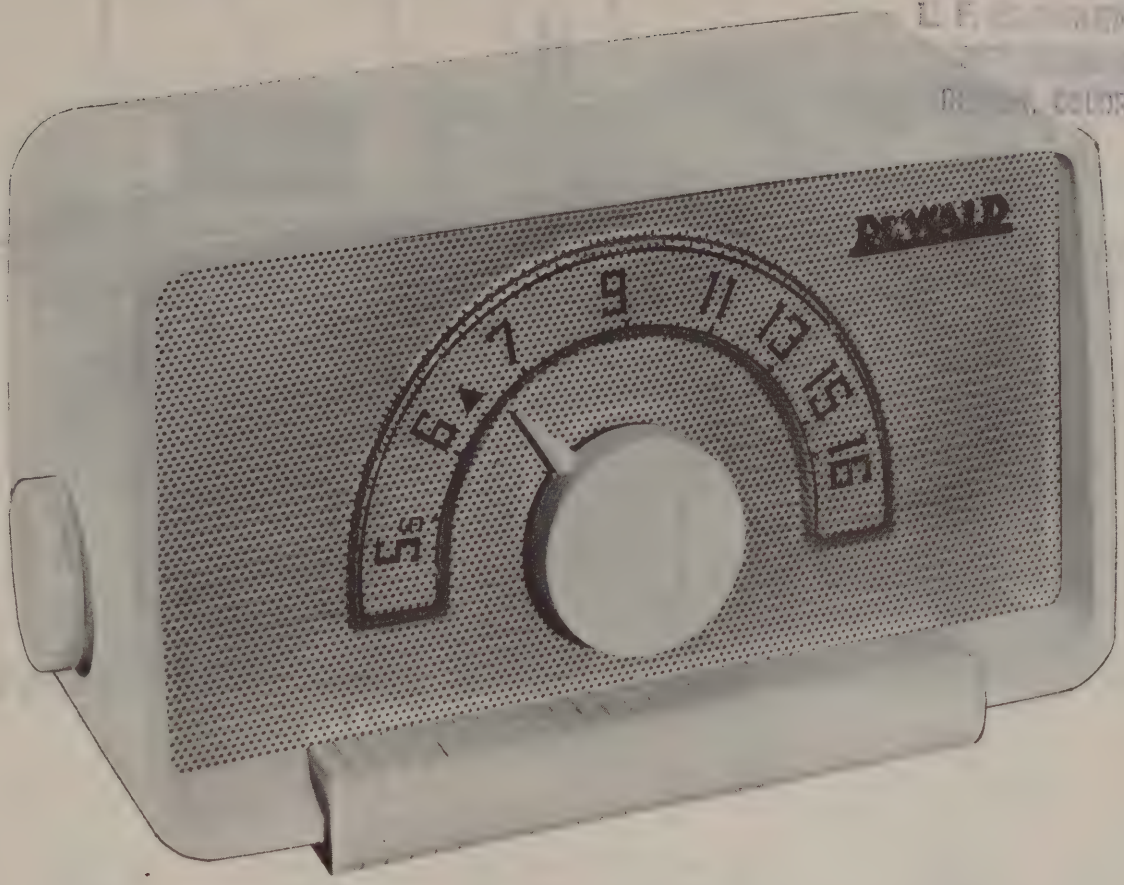
DEWALD
MODEL J-543



DEWALD
MODEL J-543

TRADE NAME	Dewald Model J-543
MANUFACTURER	Dewald Radio Mfg. Co., 35-15 37th Ave., Long Island City 1, N. Y.
TYPE SET	AC-DC Operated AM Superheterodyne Receiver
TUBES (Five)	Types 12BE6 Converter, 12BA6 IF Amplifier, 12AV6 Det. -AVC-AF Amp., 50C5 Output, 35W4 Rectifier
POWER SUPPLY	105-125 Volts AC-DC
RATING	.26 Amp. @ 117 Volts AC
TUNING RANGE—BROADCAST	535KC-1660KC

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

Volume control should be at maximum position. Output of signal generator should be no higher than necessary to obtain an output reading. Use an insulated alignment screwdriver for adjusting.
Loop should be maintained in same relative position to chassis as when receiver is in cabinet.
Use isolation transformer, if available. If not, connect a .1MFD capacitor in series with low side of signal generator and B-.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
1.	.01MFD	High side to pin 7 (grid) of 12BE6 (V1). Low side to B-.	455KC (400~ Mod.)	Tuning gang fully open	Across Voice Coil	A1, A2, A3, A4	Adjust for maximum output. If isolation transformer is not used, reduce dummy antenna to .001MFD to reduce hum modulation.
2.	"	"	1660KC	"	"	A5	"
3.		Loop	1400KC	Tune to 1400KC signal	"	A6	Fashion loop of several turns of wire and radiate signal into loop of receiver. Adjust for maximum output.

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PARTS LIST AND DESCRIPTIONS

DEWALD
Model J-543

TUBES (GENERAL ELECTRIC, SYLVANIA)

ITEM No.	USE	TYPE	NOTES
V1	Converter	12BE6	
V2	IF Amplifier	12BA6	
V3	Det. -AVC-AF Amp.	12AV6	

ITEM No.	USE	TYPE	NOTES
V4	Output	50C5	
V5	Rectifier	35W4	

ELECTROLYTIC CAPACITORS

ITEM No.	RATING		REPLACEMENT DATA						
	CAP.	VOLT.	DEWALD PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SANGAMO PART No.	SPRAGUE PART No.
C1A	30	150	E-205-4	PRS150V3030	BBRD3315	TCD47	TDL-D30-150	FMD-1530	TVA-2434
B	30	150							

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING		REPLACEMENT DATA							NOTES
	CAP.	VOLT	DEWALD PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	
C2	.05	200		BPD-05	DF-503	CUB2S5		PT415	2TM-S5	
C3A	220									
B	2000									
C	5000		♦	♦PA-113-1	♦PC-150	♦116TM1	♦1408-01		♦DT-1	
D	250									
E										
C4	20000			BPD-02	DD-203	K085	817-02		5HK-S2	
C5	.05	400		BPD-05	DF-503	CUB4S5		PT415	4TM-S5	
C6	.1	200		P288N-1	DF-104	CUB2P1		PT401	2TM-P1	Note 1
C7	.05	400		BPD-05	DF-503	CUB4S5		PT415	4TM-S5	Note 2

Note 1. Some versions may use .05MFD in this application.
Note 2. Not used in some versions.
♦ Items C3A, C3B, C3C, C3D, C3E, R5A, R5B and R5C are combined in one unit. When replacing items separately, C3D and C3E should total 250MMF.

CONTROLS

ITEM No.	RATING		REPLACEMENT DATA					INSTALLATION NOTES
	RESISTANCE	WATTS	DEWALD PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	IRC PART No.	MALLORY PART No.	
R1A	500KΩ	½	3013-A-8	AB-60	A47-500K-Z	Q13-133	U48	Volume
B	Shaft		Not Req.	AK-4	KSS-3	Not Req.	Not Req.	Attach to R1A.
C	Switch		Not Req.	KB-1	SWE-12	76-1	US-26	Attach to R1A.

RESISTORS

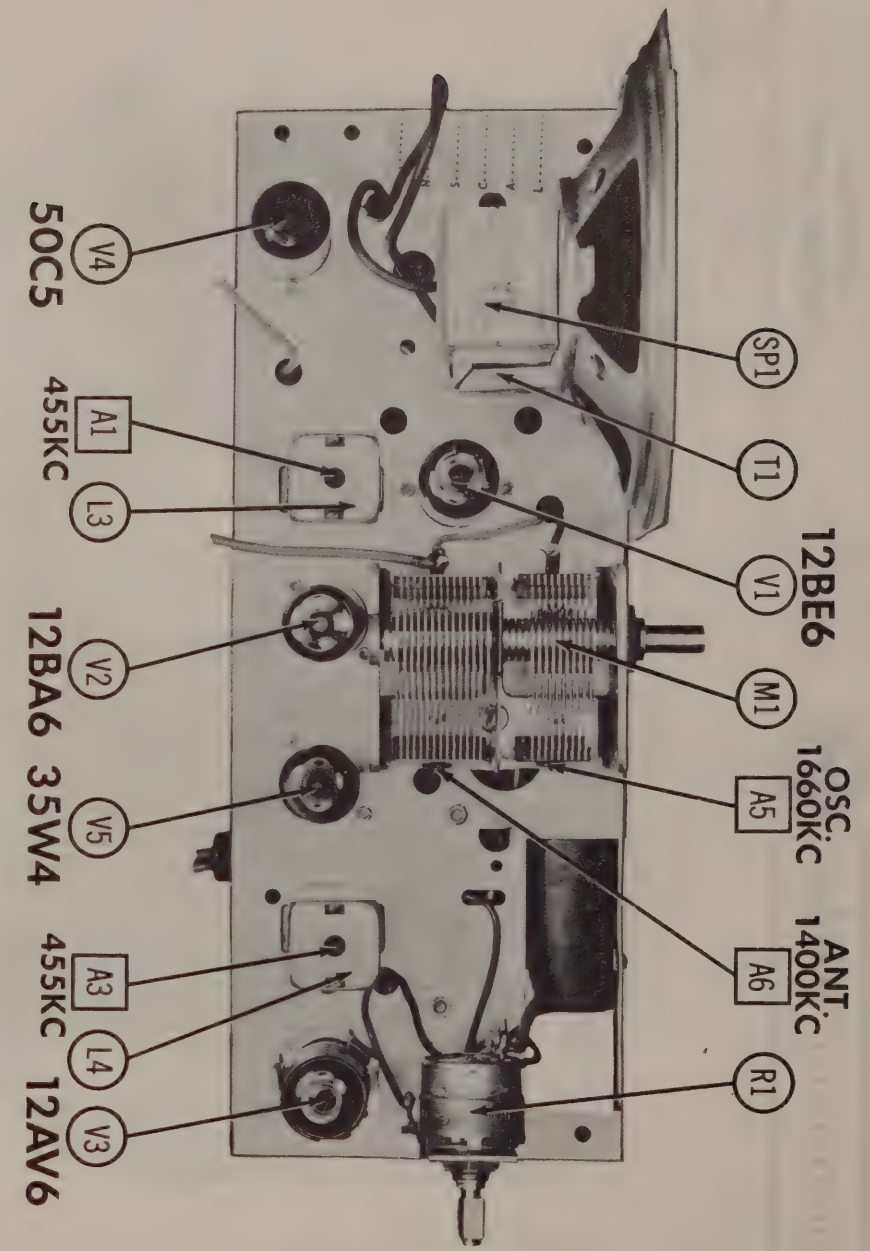
All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING		REPLACEMENT DATA		NOTES
	OHMS	WATT	DEWALD PART No.	IRC PART No.	
R2	22KΩ			BTS-22K	
R3	2.2Meg			BTS-2.2Meg	
R4	100Ω			BTS-100	
R5A	6.8Meg			BTS-6.8Meg	
B	470KΩ		♦	BTS-470K	
C	470KΩ			BTS-470K	

ITEM No.	RATING		REPLACEMENT DATA		NOTES
	OHMS	WATT	DEWALD PART No.	IRC PART No.	
R6	150Ω			BTS-150	
R7	1500Ω	1		BTA-1500	

♦ Items R5A, R5B, R5C, C3A, C3B, C3C, C3D, C3E are combined in one unit.

CHASSIS—TOP VIEW



PARTS LIST AND DESCRIPTIONS (Continued)

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE		REPLACEMENT DATA						NOTES
	PRI.	SEC.	DEWALD PART No.	Halldorson PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	
T1	2.3KΩ	3-4Ω	Part of spkr. 7003C-5	Z1101	A-3025	A-3332	26S58	S-12X	

SPEAKER

ITEM No.	RATINGS			REPLACEMENT DATA			NOTES
	SIZE	FIELD	V. C. IMP.	DEWALD PART No.	QUAM PART No.	RCA TYPE No.	
SP1	4"	PM	3-4Ω	7003C-5	4A07	223S1	

COILS (RF-IF)

ITEM No.	USE	DC RES.		REPLACEMENT DATA				NOTES
		PRI.	SEC.	DEWALD PART No.	MEISSNER PART No.	MERIT PART No.	MILLER PART No.	
L1	Loop Ant.	2.8Ω		CB420				Includes cabinet back
L2	Osc. Coil	.9Ω	5.3Ω	1154D-4			69-Osc. *	
L3	Input IF	15Ω	15Ω	1-110	16-6758	BC-352	12-C1	
L4	Output IF	15Ω	15Ω	1-110	16-6758	BC-353	12-C2	

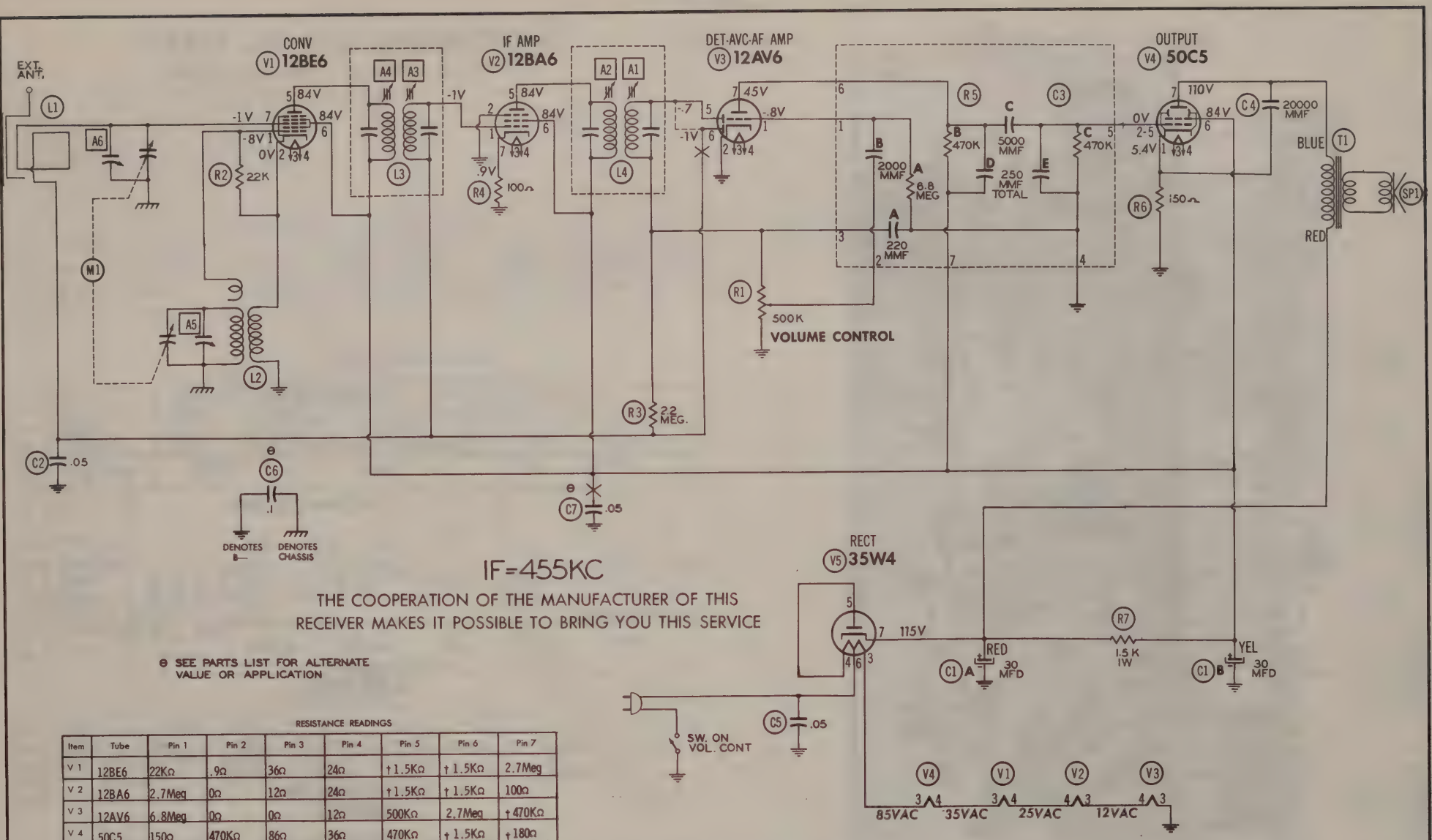
* Drill mounting hole.

MISCELLANEOUS

ITEM No.	PART NAME	DEWALD PART No.	NOTES
M1	Tuning Cap.	2072-5	2 Gang (22-460MMF, 33-195MMF)
	Cabinet	C421A-1	Ivory
	Cabinet	C421A-2	Mahogany
	Knob	K427A-1	Tuning
	Knob	4228D-3	On-Off-Volume

CHASSIS—BOTTOM VIEW

DEWALD Model J-543



IF=455KC

THE COOPERATION OF THE MANUFACTURER OF THIS RECEIVER MAKES IT POSSIBLE TO BRING YOU THIS SERVICE

⊖ SEE PARTS LIST FOR ALTERNATE VALUE OR APPLICATION

RESISTANCE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7
V 1	12BE6	22KΩ	.9Ω	36Ω	24Ω	†1.5KΩ	†1.5KΩ	2.7Meg
V 2	12BA6	2.7Meg	0Ω	12Ω	24Ω	†1.5KΩ	†1.5KΩ	100Ω
V 3	12AV6	6.8Meg	0Ω	0Ω	12Ω	500KΩ	2.7Meg	†470KΩ
V 4	50C5	150Ω	470KΩ	86Ω	36Ω	470KΩ	†1.5KΩ	†180Ω
V 5	35W4	NC	NC	86Ω	120Ω	120Ω	117Ω	11KΩ

† MEASURED FROM PIN 7 OF V5.
NC-NO CONNECTION.

1. DC voltage measurements taken with vacuum tube voltmeter; AC voltages measured at 1000 ohms per volt.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance on component values makes possible a variation of ± 15% in voltage and resistance readings.
6. Volume control at maximum, no signal applied for voltage measurements.

A PHOTOFACT STANDARD NOTATION SCHEMATIC

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323-5

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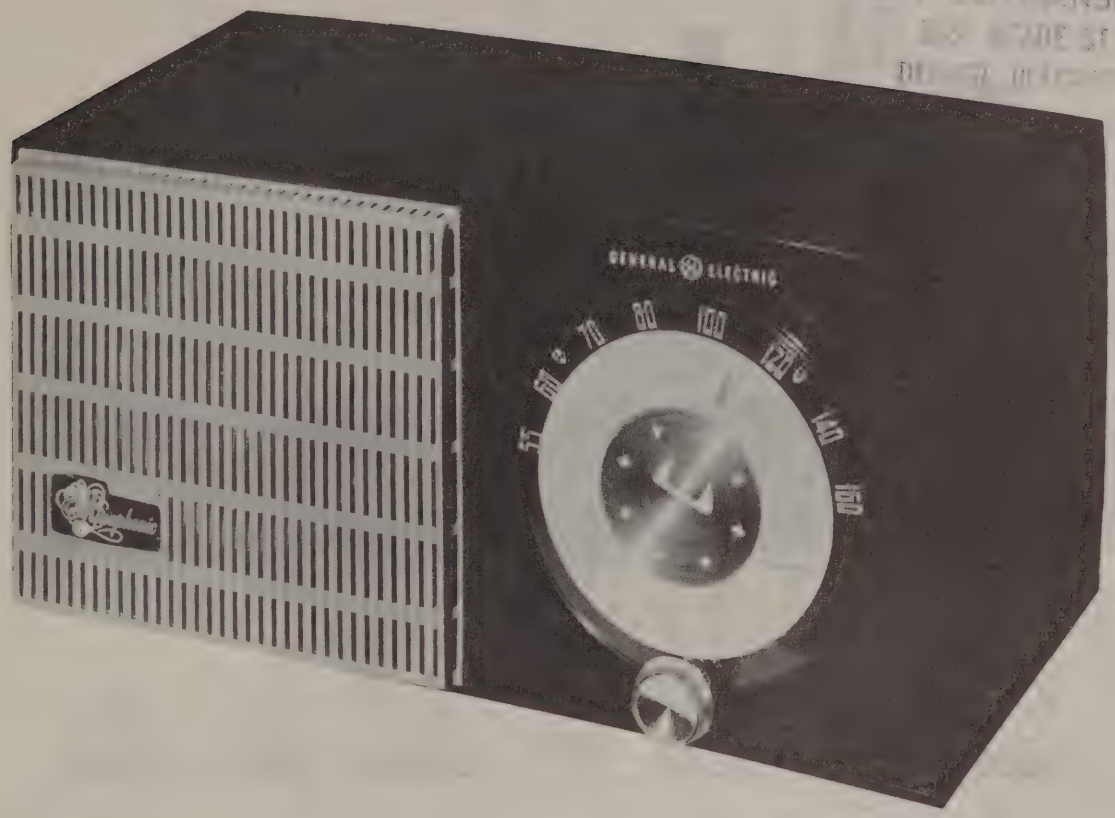
GENERAL ELECTRIC
MODELS 470, 471, 472



GENERAL ELECTRIC
MODELS 470, 471, 472

TRADE NAME	General Electric Models 470, 471, 472
MANUFACTURER	General Electric Co., Electronics Dept., Electronics Park, Syracuse, N.Y.
TYPE SET	AC-DC Operated AM Superheterodyne Receiver
TUBES (Five)	Types 12BE6 Converter, 12BA6 IF Amplifier, 12AV6 Det.-AVC-AF Amp., 50C5 Output, 35W4 Rectifier
POWER SUPPLY	105-120 Volts AC-DC — RATING .23 Amp. @ 117 Volts AC
TUNING RANGE—BROADCAST	540KC-1620KC

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

Volume control should be at maximum position. Output of signal generator should be no higher than necessary to obtain an output reading. Use an insulated alignment screwdriver for adjusting.
Loop should be maintained in same relative position to chassis as when receiver is in cabinet.
Use isolation transformer, if available. If not, connect a .1MFD capacitor in series with low side of signal generator and B-.
To set pointer, turn tuning capacitor fully closed and set pointer to last reference mark at low frequency end of dial.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
1.	.05MFD	High side to pin 7 (grid) of 12BE6 (V1). Low side to B-.	455KC (400~ Mod.)	Tuning gang fully open	Across Voice Coil	A1, A2, A3, A4	Adjust for maximum output. If isolation transformer, is not used, reduce dummy antenna to .001MFD to reduce hum modulation.
2.		Loop	1620KC	"	"	A5	Fashion loop of several turns of wire and radiate signal into loop of receiver. Adjust for maximum output.
3.		"	1500KC	Tune to 1500KC signal	"	A6	Adjust for maximum output while rocking tuning gang.

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PARTS LIST AND DESCRIPTIONS

TUBES (GENERAL ELECTRIC, SYLVANIA)

ITEM No.	USE	TYPE	NOTES
V1	Converter	12BE6	
V2	IF Amplifier	12BA6	
V3	Det. -AVC-AF Amp.	12AV6	
V4	Output	50C5	
V5	Rectifier	35W4	

ELECTROLYTIC CAPACITORS

ITEM No.	RATING CAP.	RATING VOLT.	REPLACEMENT DATA G. E. PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SANGAMO PART No.	SPRAGUE PART No.
C1A	100	150	RCE-166	PRS150V8040-20	BBRT84215	TCT3117	TDL-804020-150	FMD-1550	R1507 *
B	50	150						FM-1550	

* Unit must be ordered from manufacturer.

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING CAP.	RATING VOLT	REPLACEMENT DATA G. E. PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	NOTES
C2	.05	200	UCC-045	BPD-05	DF-503	CUB2S5		PT415	2TM-S5	
C3	47		RCW-3075							
C4	.01	200	UCC-008	BPD-01	D6-103	CUB4S1	GP3-333-103	PT411	4TM-S1	
C5	220		RCW-3195	S1-220	DD-221	G051	811-221	UC-5322	5GA-T22	
C6	.02	400	RCC-129	BPD-02	DF-203	CUB4S2	817-02	PT412	4TM-S2	
C7	220		RCW-3195	S1-220	DD-221	G051	811-221	UC-5322	5GA-T22	
C8	.02	400	RCC-129	BPD-02	DF-203	CUB4S2	817-02	PT412	4TM-S2	
C9A	6800		†RCW-3104	†PA155	D6-682	K061	811-0068	811-0068	5GA-D68	
B	5000				DD-502	K080	811-005	811-005	5HK-D5	
C10	.047	200	RCC-126	BPD-05	DF-503	CUB2S47			2TM-S47	
C11	.047	600	RCN-053	BPD-05	DF-503	CUB6S47			6TM-S47	
C12	.05	400	UCC-045	BPD-05	DF-503	CUB4S47			4TM-S5	

† Items C9A and C9B are combined in one unit.

CONTROLS

ITEM No.	RATING RESISTANCE	RATING WATTS	REPLACEMENT DATA G. E. PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	IRC PART No.	MALLORY PART No.	INSTALLATION NOTES
R1	4Meg	½	RRC-326					Volume & Switch

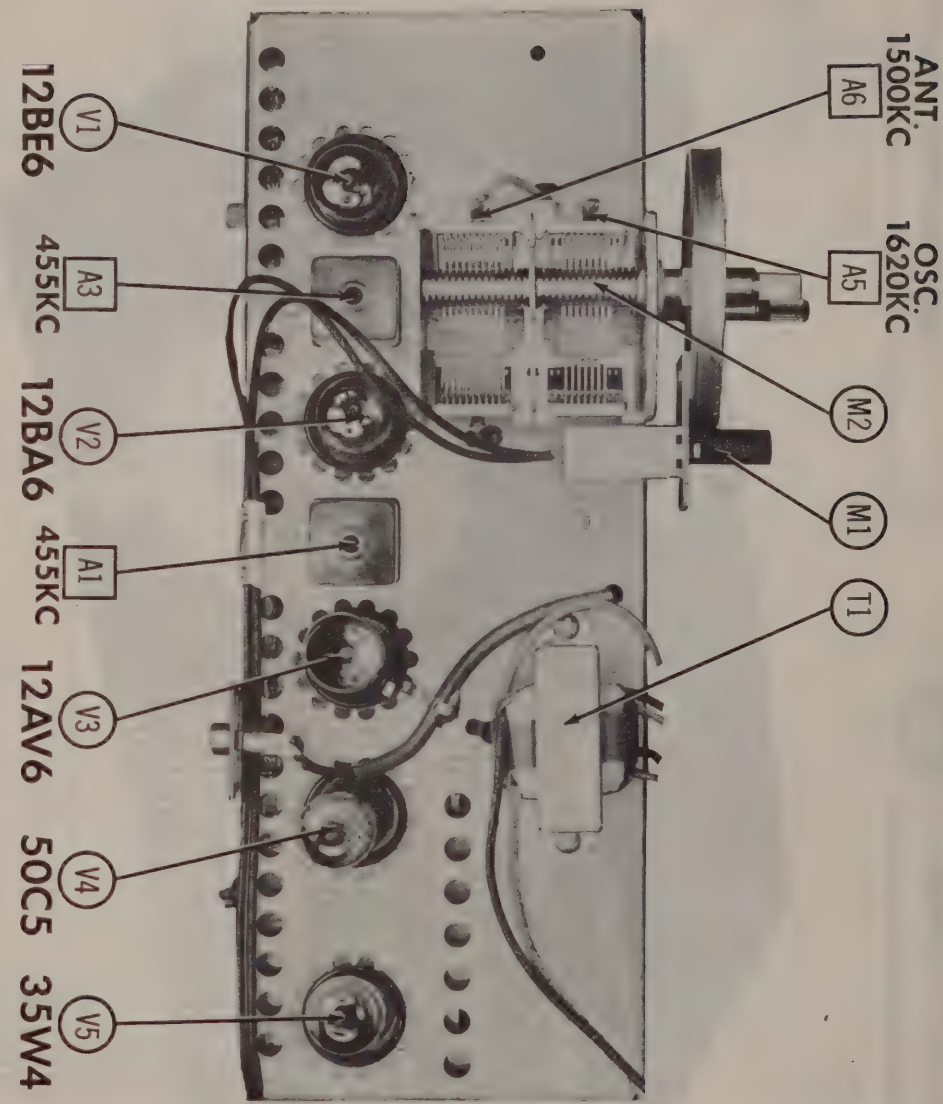
RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING OHMS	RATING WATT	REPLACEMENT DATA G. E. PART No.	REPLACEMENT DATA IRC PART No.	NOTES
R2	22KΩ			BTS-22K	
R3	100Ω			BTS-100	
R4	100KΩ			BTS-100K	
R5	68Ω			BTS-68	
R6	2.2Meg			BTS-2.2Meg	
R7	330KΩ			BTS-330K	
R8	6.8Meg			BTS-6.8Meg	
R9	470KΩ			BTS-470K	

ITEM No.	RATING OHMS	RATING WATT	REPLACEMENT DATA G. E. PART No.	REPLACEMENT DATA IRC PART No.	NOTES
R10	470KΩ			BTS-470K	
R11	150Ω			BTS-150	
R12	4700Ω			BTS-4700	
R13	15KΩ			BTS-15K	
R14	820Ω			BTS-820	
R15	1500Ω	2		BTB-1500	
R16	18Ω			BTS-18	

CHASSIS—TOP VIEW



PARTS LIST AND DESCRIPTIONS (Continued)

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE		REPLACEMENT DATA						NOTES
	PRI.	SEC.	G. E. PART No.	Halldorson PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	
T1	2.4KΩ	3-4Ω	RTO-157						

SPEAKER

ITEM No.	RATINGS			REPLACEMENT DATA			NOTES
	SIZE	FIELD	V. C. IMP.	G. E. PART No.	QUAM PART No.	RCA TYPE No.	
SP1	5½"	PM	3-4Ω	ROP-030	52A1	217S1	

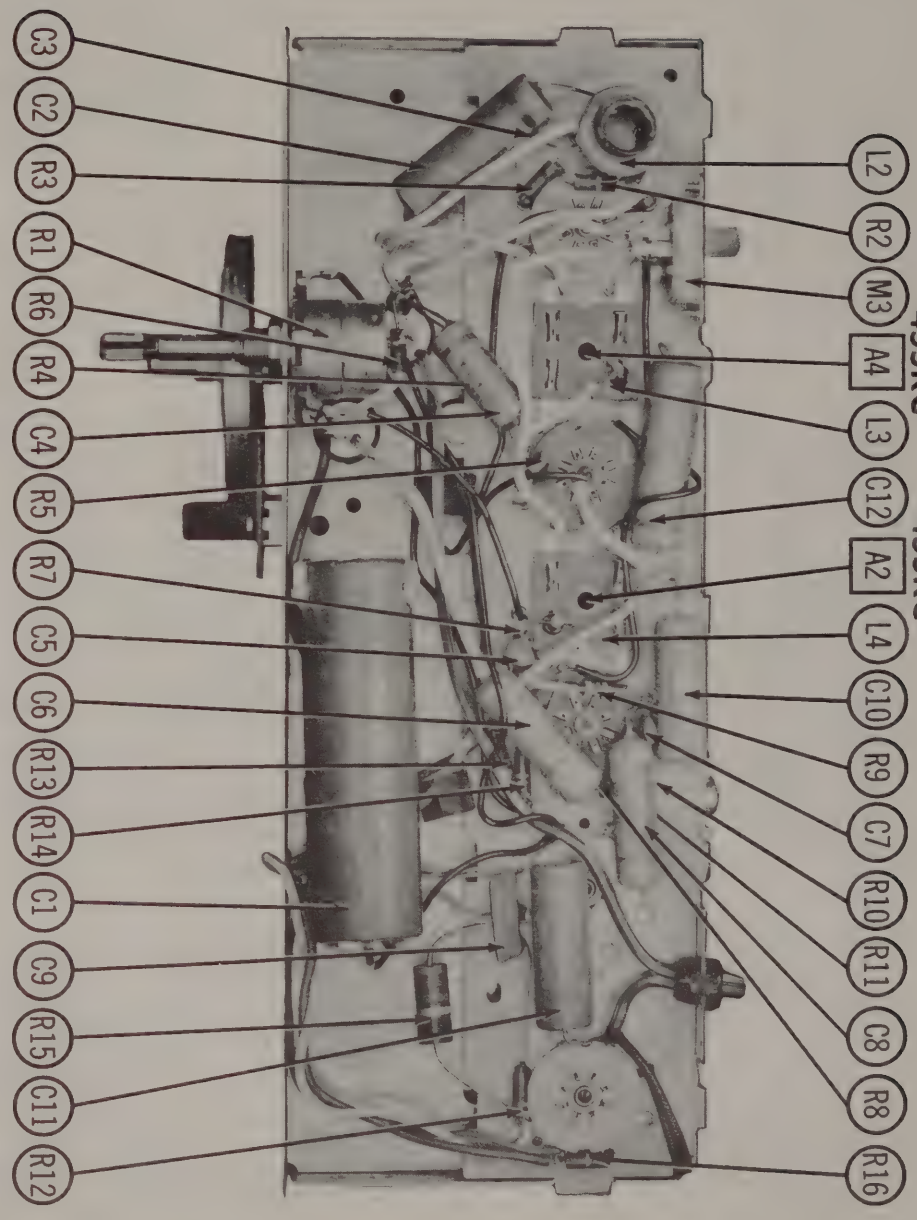
COILS (RF-IF)

ITEM No.	USE	DC RES.		REPLACEMENT DATA				NOTES
		PRI.	SEC.	G. E. PART No.	MEISSNER PART No.	MERIT PART No.	MILLER PART No.	
L1	Loop Stick	.4Ω		RLL-055				
L2	Osc. Coil	.6Ω	6.8Ω	RLC-122				
L3	Input IF	13Ω	13Ω	RTL-143	16-6758	BC-352	12-C1	
L4	Output IF	13Ω	13Ω	RTL-143	16-6758	BC-353	12-C2	

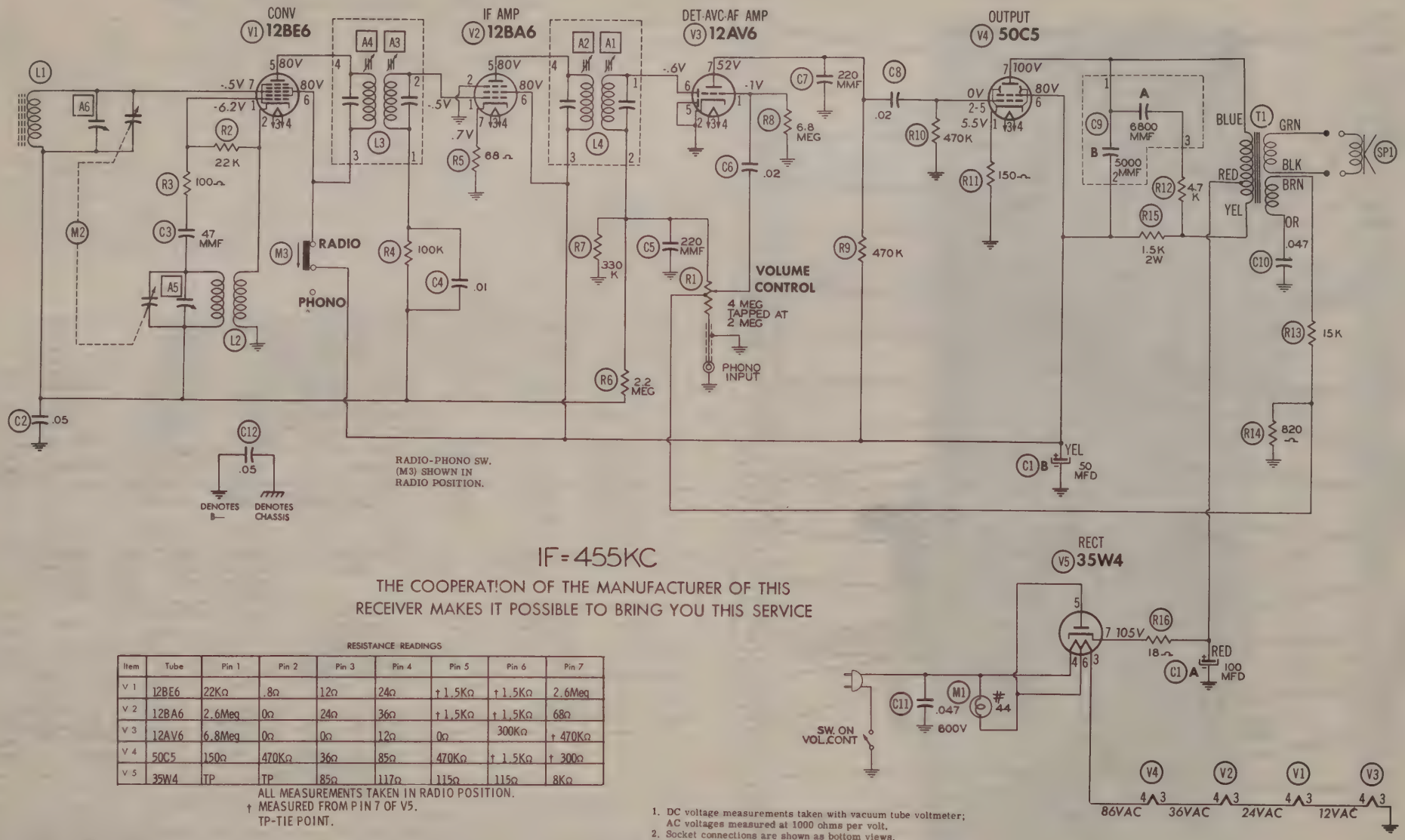
MISCELLANEOUS

ITEM No.	PART NAME	G. E. PART No.	NOTES
M1	Dial Light		#44
M2	Tuning Cap.	RCT-085	2 Gang (19-320MMF, 23-150MMF)
M3	Switch	RSS-009	Radio-Phono (SPST-Slide Type)
	Cabinet	RAU-438	Mahogany, Model 470
	Cabinet	RAU-439	Ivory, Model 471
	Cabinet	RAU-440	Red, Model 472
	Knob	RDK-425	On-Off-Volume
	Knob	RDK-497	Tuning, Model 470
	Knob	RDK-498	Tuning, Model 471
	Knob	RDK-499	Tuning, Model 472

CHASSIS—BOTTOM VIEW



GENERAL ELECTRIC
Model 470



IF = 455KC

THE COOPERATION OF THE MANUFACTURER OF THIS RECEIVER MAKES IT POSSIBLE TO BRING YOU THIS SERVICE

RESISTANCE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7
V 1	12BE6	22KΩ	.8Ω	12Ω	24Ω	† 1.5KΩ	† 1.5KΩ	2.6Meg
V 2	12BA6	2.6Meg	0Ω	24Ω	36Ω	† 1.5KΩ	† 1.5KΩ	68Ω
V 3	12AV6	6.8Meg	0Ω	0Ω	12Ω	0Ω	300KΩ	† 470KΩ
V 4	50C5	150Ω	470KΩ	36Ω	85Ω	470KΩ	† 1.5KΩ	† 300Ω
V 5	35W4	TP	TP	85Ω	117Ω	115Ω	115Ω	8KΩ

ALL MEASUREMENTS TAKEN IN RADIO POSITION.
† MEASURED FROM PIN 7 OF V5.
TP-TIE POINT.

1. DC voltage measurements taken with vacuum tube voltmeter; AC voltages measured at 1000 ohms per volt.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance on component values makes possible a variation of ± 15% in voltage and resistance readings.
6. Volume control at maximum, no signal applied for voltage measurements.

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PHOTOFACT* Folder
*TRADE MARK

HALLICRAFTERS MODELS 24TS610B, M, 24TS611B, M (Ch. C2001D, D2001D)

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HALLICRAFTERS MODEL 24TS610B

TRADE NAME	Hallicrafters	MODELS	CHASSIS
		24TS610B, 24TS610M	C2001D
		24TS611B, 24TS611M	D2001D
MANUFACTURER	The Hallicrafters Co., 4401 W. 5th. Ave., Chicago 24, Illinois		
TYPE SET	Television Receiver		
TUBES	Fifteen		
POWER SUPPLY	110-120 Volts AC-60 Cycles	RATING 1.2 Amp. @ 117 Volts AC	
TUNING RANGE	Channels 2 thru 13 VHF, 14 thru 83 UHF, Video IF 45.75MC, Sound IF 41.25MC (Intercarrier)		

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HALLICRAFTERS MODELS 24TS610B, M, 24TS611B, M (Ch. C2001D, D2001D)

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DISASSEMBLY INSTRUCTIONS

CABINET REMOVAL

1. Remove 6 push-on type control knobs from side panel of cabinet.

2. Remove 5 wood screws and 1 metal screw. Remove rear cover.

3. Disconnect speaker leads. Remove 2 speaker nuts. Remove speaker.

4. Remove picture tube socket, ion trap, HV lead, yoke plug assembly and ground strap.

5. Remove 2 wood screws holding antenna and interlock bracket.

6. Remove 2 wood screws from 2 brackets at the top rear of the cabinet.

7. Remove 3 chassis bolts. Remove chassis.

MODELS	CHASSIS
24TS610B, 24TS610M	C2001D
24TS611B, 24TS611M	D2001D

HALLICRAFTERS MODELS
24TS610B, M, 24TS611B, M
(Ch. C2001D, D2001D)

SERVICING IN THE FIELD

TUNER OSCILLATOR ADJUSTMENTS

Touch-up adjustments of the VHF tuner oscillator circuit may be accomplished by removal of the channel selector and fine tuning knobs. The adjustments are accessible, one at a time, thru the small hole in the cabinet to the right of the channel selector shaft.

PICTURE TUBE SAFETY GLASS CLEANING

Remove 5 wood screws holding plastic molding at the top edge of the safety glass. Remove plastic molding and safety glass. Use extreme caution when removing safety glass.

SERVICE ADJUSTMENT LOCATION

See tube placement chart on page 5.

HORIZONTAL OSCILLATOR FIELD ADJUSTMENT

For adjustment of the horizontal oscillator, it is necessary to remove the rear cover and supply power to the set. Adjustment is located on tube side of the chassis. Set the horizontal hold control to the center of its range and adjust the horizontal frequency slug (L25) until the picture synchronizes horizontally.

SOUND IF DETECTOR BUZZ ADJUSTMENT

Adjust the buzz control located on the rear apron of the chassis for maximum volume and minimum buzz. If results are unsatisfactory, see "Sound IF Alignment" instructions on pages 6 and 7.

CENTERING

Centering is accomplished mechanically by adjusting two magnetic rings around the neck of the picture tube, located flush against the deflection yoke. Rotate the two rings around the neck of the tube until the picture is properly centered.

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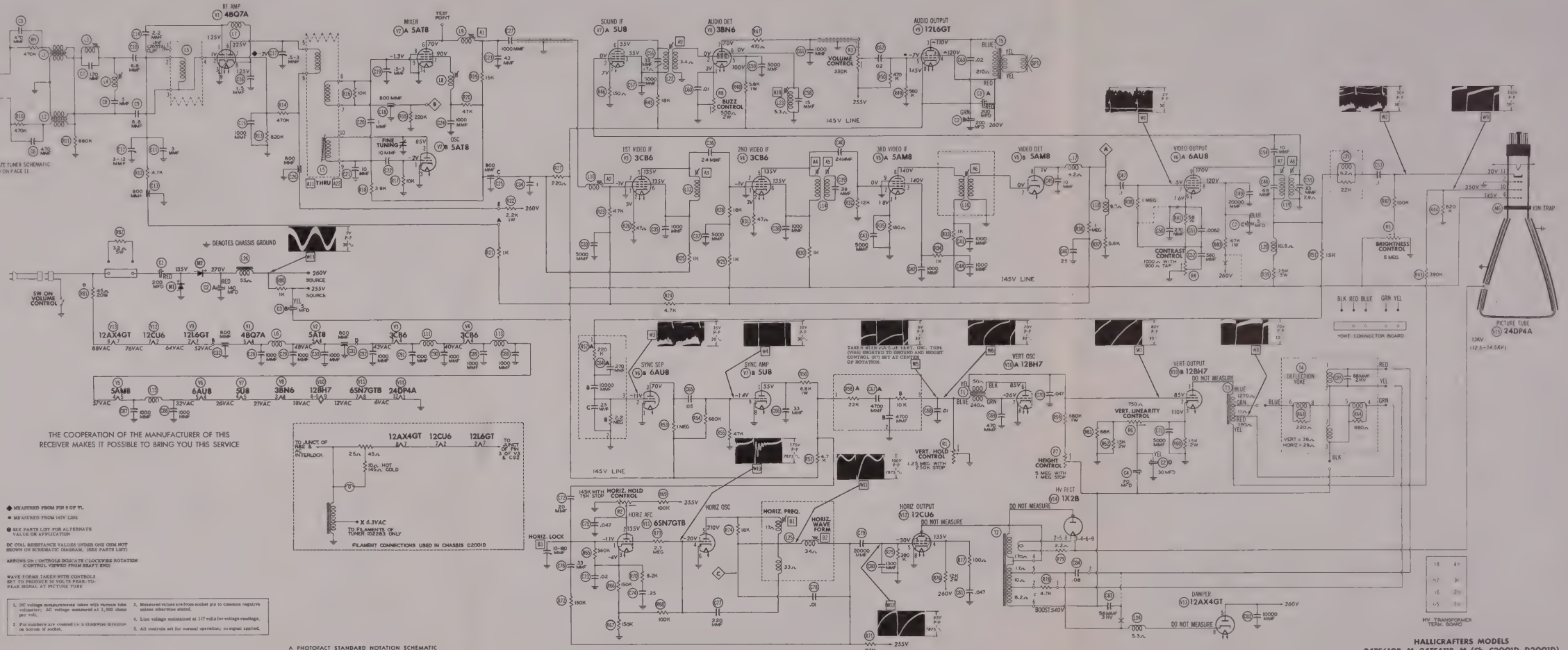
RF AMP V1 4BQ7A
MIXER V2 A 5AT8
TEST POINT
SOUND IF V7 A 5U8
AUDIO DET V8 3BN6
AUDIO OUTPUT V9 12L6GT
VOLUME CONTROL
BUZZ CONTROL
1ST VIDEO IF V3 3CB6
2ND VIDEO IF V4 3CB6
3RD VIDEO IF V5 A 5AM8
VIDEO DET V5 B 5AM8
VIDEO OUTPUT V6 A 6AU8
CONTRAST CONTROL
BRIGHTNESS CONTROL
5 MEG
OSC V7 B 5AT8
FINE TUNING
ALTERNATE TUNER SCHEMATIC LOCATED ON PAGE 11
VHF ANT TERM BOARD
DENOTES CHASSIS GROUND
SW ON VOLUME CONTROL
260V SOURCE
255V SOURCE
145V LINE
SYNC SEP V6 B 6AU8
SYNC AMP V7 B 5U8
VERT OSC V10 A 12BH7
VERT. HOLD CONTROL
1.25 MEG WITH 250K STOP
HEIGHT CONTROL
5 MEG WITH 1 MEG STOP
VERT. OUTPUT V10 B 12BH7
DO NOT MEASURE
VERT. LINEARITY CONTROL
DEFLECTION YOKE
YOKE CONNECTOR BOARD
PICTURE TUBE V15 24DP4A
ION TRAP
HV RECT V14 1X2B
HV TRANSFORMER TERM. BOARD
HORIZ OSC
HORIZ. FREQ.
HORIZ. WAVE FORM
HORIZ OUTPUT V12 12CU6
HORIZ. HOLD CONTROL
HORIZ AFC
HORIZ. LOCK
6SN7GTB
DAMPER V11 12AX4GT
BOOST 540V
12AX4GT 12CU6 12L6GT
FILAMENT CONNECTIONS USED IN CHASSIS D2001D
12AX4GT 12CU6 12L6GT 5AM8 6AU8 5U8 3BN6 12BH7 6SN7GTB 24DP4A
88VAC 76VAC 64VAC 52VAC 48VAC 43VAC 40VAC 37VAC 32VAC 26VAC 21VAC 18VAC 12VAC 6VAC
THE COOPERATION OF THE MANUFACTURER OF THIS RECEIVER MAKES IT POSSIBLE TO BRING YOU THIS SERVICE
◆ MEASURED FROM PIN 8 OF V1.
● MEASURED FROM 145V LINE
SEE PARTS LIST FOR ALTERNATE VALUE OR APPLICATION
DC COIL RESISTANCE VALUES UNDER ONE OHM NOT SHOWN ON SCHEMATIC DIAGRAM. (SEE PARTS LIST)
ARROWS ON CONTROLS INDICATE CLOCKWISE ROTATION (CONTROL VIEWED FROM SHAFT END)
WAVE FORMS TAKEN WITH CONTROLS SET TO PRODUCE 50 VOLTS PEAK-TO-PEAK SIGNAL AT PICTURE TUBE
1. DC voltage measurements taken with vacuum tube voltmeter. AC voltage measured at 1,000 ohms per volt.
2. Pin numbers are counted in a clockwise direction on bottom of socket.
3. Measured values are from socket pin to common negative unless otherwise stated.
4. Line voltage maintained at 117 volts for voltage readings.
5. All controls set for normal operation; no signal applied.
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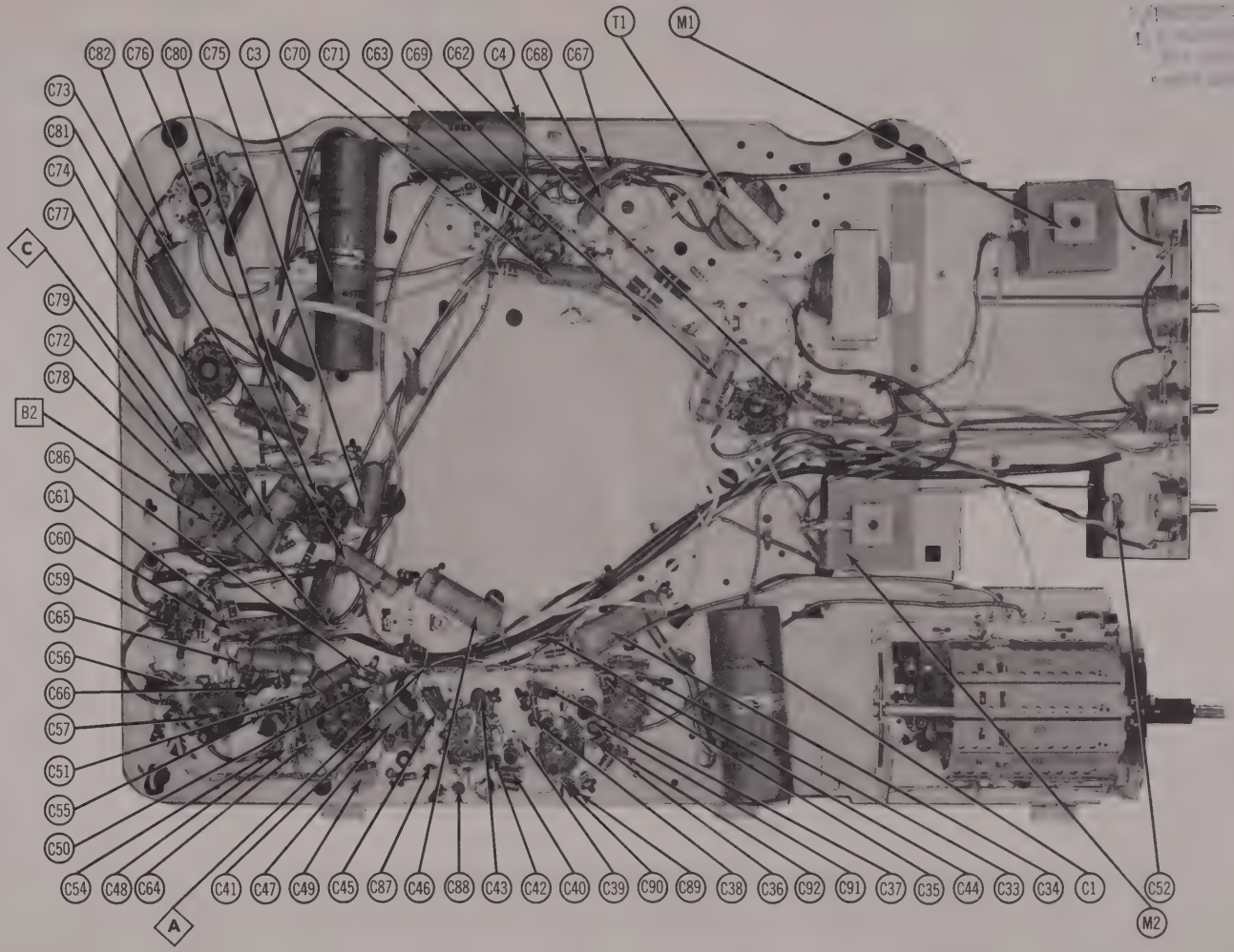
HALLICRAFTERS MODELS 24TS610B, M, 24TS611B, M (Ch. C2001D, D2001D)



CHASSIS BOTTOM VIEW-CAPACITOR AND ALIGNMENT IDENTIFICATION

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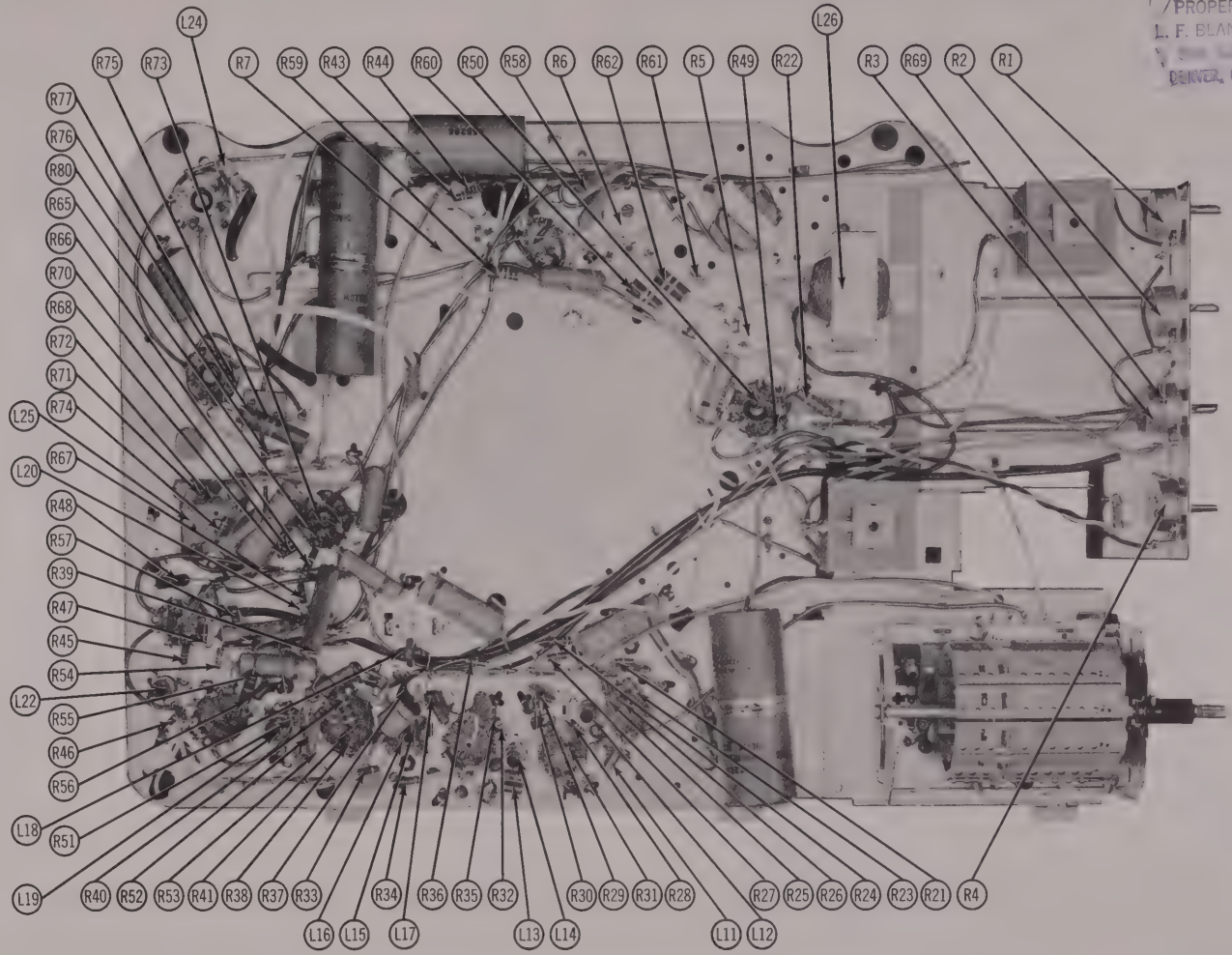
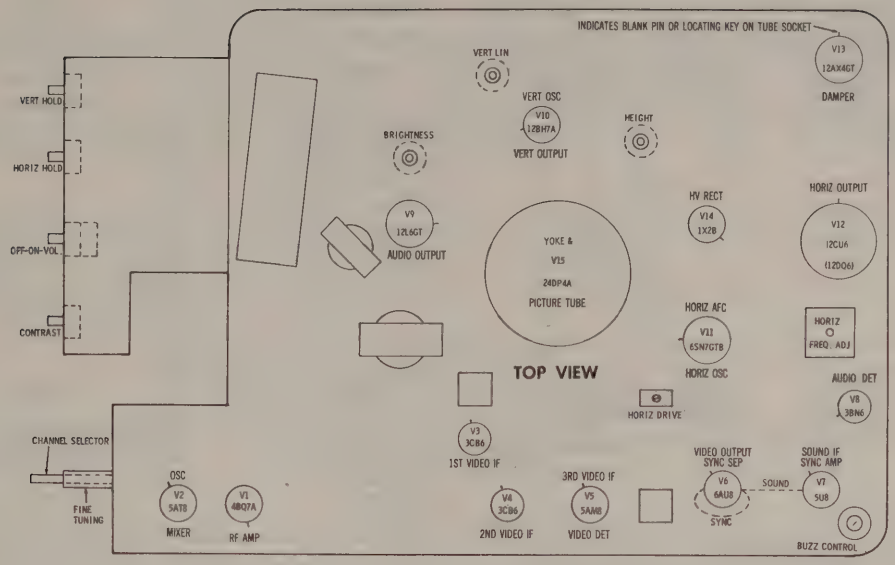


CHASSIS BOTTOM VIEW-RESISTOR AND INDUCTOR IDENTIFICATION

TUBE PLACEMENT CHART



TUBE FAILURE CHECK CHART

The following chart lists tubes whose failures are most likely to produce the indicated symptoms. Refer to tube placement chart for location and type of tube.

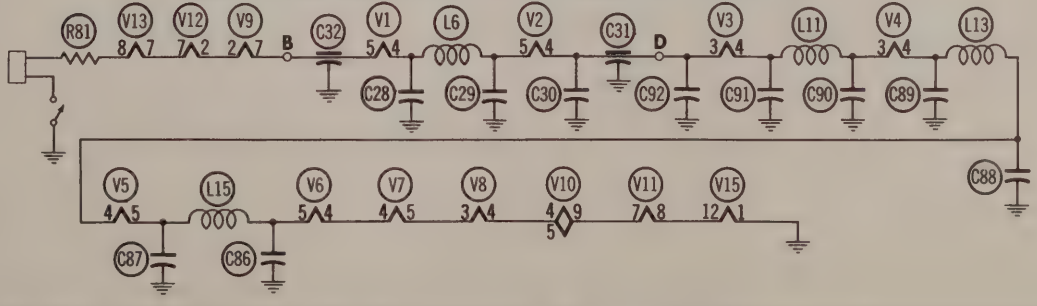
POWER SUPPLY FAILURE
No raster, no sound - **Selenium Rectifiers (M1 & M2)**

LOSS OF PICTURE OR SOUND
No pic, no sound, has raster - **V2, V3, V4, V5, V6, V9**
No pic, no sound, has snow - **V1, V2, V3**
No pic, has sound, has raster - **V6, V15**
Has pic, no sound - **V7, V8, V9**

SYNC FAILURE
No vert. sync - **V7, V10**
No horiz. sync - **V7, V11**
No vert. or horiz. sync - **V6, V7**

SWEEP FAILURE
No raster, has sound - **V11, V12, V13, V14, V15**
No vertical deflection - **V10**
Poor vert. linearity or foldover - **V10**
Poor horiz. linearity or foldover - **V11, V12, V13**
Narrow picture - **V11, V12, V13, V14, M1, M2**
Vert. off freq. - **V7, V10,**
Horiz. off freq. - **V7, V11**

NOTE: Since this receiver employs tubes used in series-parallel filament network, an open filament in any tube in series may cause the set to be inoperative. (See circuit below).



ALIGNMENT INSTRUCTIONS

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

Use an isolation transformer to protect the test equipment.
The high voltage lead should be securely taped away from chassis.

VIDEO IF ALIGNMENT

Connect the negative lead of a 3 volt bias supply to the ungrounded side of C46. Connect the positive lead to chassis. Two peaks may occur during alignment of the video IF coils. Use the peak with the slug entering the coil from the end nearest the chassis.
The sound trap (A5) should be tuned with the slug entering the coil from the end away from the chassis.
Use only enough sweep generator output to provide usable pattern on scope. If the sweep generator has no built-in marker, loosely couple a separate marker to the sweep generator output.
Connect the synchronized sweep voltage from the sweep generator to the horizontal input of the oscilloscope for horizontal deflection.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
1.	.01MFD	High side to point (B). Low side to chassis.	44MC (10MC Swp.)	41.25MC 45.75MC	Between any two channels.	Vert. amp. thru detector probe (Fig. 1) to pin 5 (plate) of 1st video IF amp. tube (V3). Low side to chassis.	A1, A2	Adjust A1 and A2 for response curve similar to Fig. 2 with markers in proper position. Remove scope and detector from pin 5 of V3.
2.	"	"	"	41.25MC 42.5MC 45.75MC	"	Vert. amp. thru 3.3KΩ to point (A). Low side to chassis.	A3, A4, A5, A6	Adjust for response curve similar to Fig. 3. Adjust A5 for MINIMUM amplitude at 41.25MC. A3 affects the high frequency end of response curve and A4 affects the low frequency end. A6 affects the center of response curve. Adjust A6 for maximum amplitude and MINIMUM tilt.

4.5MC TRAP ALIGNMENT

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
3.	.001MFD	High side to point (A). Low side to chassis.	Not used	4.5MC (400∿Mod.)	Between any two channels.	Vert. amp. thru detector (Fig. 4) to pin 11 (cathode) of picture tube. Low side to chassis.	A7	Turn contrast control fully clockwise. Adjust A8 completely out of coil. Then adjust A7 for MINIMUM 400∿ indication on scope.

SOUND IF ALIGNMENT

Set the volume control for normal volume.
Use frequency modulated signal with 60∿ modulation and 450KC sweep. Use 120∿ sawtooth voltage in scope for horizontal deflection.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
4.	.001MFD	High side to point (A). Low side to chassis.	4.5MC (400∿ Mod. 50KC Swp.)	4.5MC	Between any two channels	Across secondary of audio output trans. (T5).	A10	Set buzz control (R8) 90° from maximum clockwise rotation. Adjust A10 for maximum 400∿ indication on scope.
5.	"	"	"	"	"	"	A8, A9	Attenuate generator output so that signal level is below limiting level of the 6BN6 as evidenced by background hiss and noise in the sound. Adjust A8 and A9 for maximum response on scope.
6.	"	"	Not used	4.5MC (400∿Mod.)	"	"	R8	Use high signal generator output and adjust R8 for MINIMUM 400∿ indication on scope.
7.	"	"	4.5MC (400∿Mod. 50KC Swp.)	4.5MC	"	"	A10	With volume control at low level, retouch A10 for maximum 400∿ indication on scope. Remove test equipment. Connect antenna and tune in the weakest station in that area and retouch R7 for MINIMUM buzz and hiss. Tune in strongest TV station in that area and adjust A10 for clearest sound.

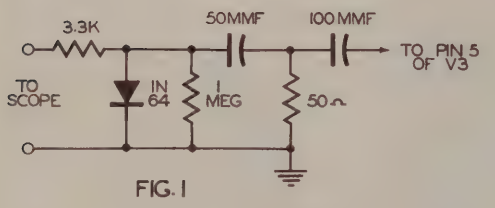


FIG. 1

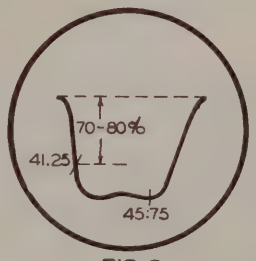


FIG. 2

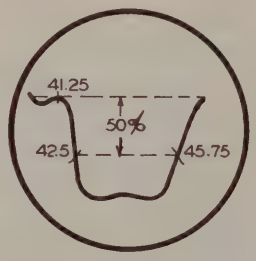


FIG. 3

ALIGNMENT INSTRUCTIONS (cont)

VHF OSCILLATOR ALIGNMENT FOR TUNER #1D2548

Leave the bias connected as under "Video IF Alignment".
The channel oscillator adjustment screws are reached through a hole just to the right of the channel switch shaft. The correct adjustment screw is accessible through this hole as the channel switch is turned to each channel.
Connect the synchronized sweep voltage from the sweep generator to the horizontal input of the oscilloscope for horizontal deflection.
The sweep generator output lead should be terminated with its characteristic impedance, usually 50 ohms.
Set the fine tuning control to the mid-position of its range.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
8.	Two 120Ω Carbon Resistors	Across antenna terminals with 120Ω in each lead.	213MC (10MC Swp.)	211. 25MC 215. 75MC	13	Vert. amp. thru 3. 3KΩ to point (A). Low side to chassis.	All	Adjust to place sound marker in trap as in Fig. 5. Video marker should be at 50%.
			207MC (10MC Swp.)	205. 25MC 209. 75MC	12		A12	
			201MC (10MC Swp.)	199. 25MC 203. 75MC	11		A13	
			195MC (10MC Swp.)	193. 25MC 197. 75MC	10		A14	
			189MC (10MC Swp.)	187. 25MC 191. 75MC	9		A15	
			183MC (10MC Swp.)	181. 25MC 185. 75MC	8		A16	
			177MC (10MC Swp.)	175. 25MC 179. 75MC	7		A17	
			85MC (10MC Swp.)	83. 25MC 87. 75MC	6		A18	
			79MC (10MC Swp.)	77. 25MC 81. 75MC	5		A19	
			69MC (10MC Swp.)	67. 25MC 71. 75MC	4		A20	
			63MC (10MC Swp.)	61. 25MC 65. 75MC	3		A21	
			57MC (10MC Swp.)	55. 25MC 59. 75MC	2		A22	

RF AND MIXER ALIGNMENT FOR TUNER #1D2548

The RF and Mixer portion of this receiver has been properly aligned at the factory and is very stable. Alignment of this portion of the receiver should not be required in the field.

VHF TUNER ALIGNMENT FOR TUNER #1D2283

The VHF portion of this receiver has been properly aligned at the factory and is very stable. Alignment of this portion of the receiver should not be required in the field.

UHF TUNER ALIGNMENT FOR TUNER #1D2283

The UHF tuner portion of this receiver has been properly aligned at the factory and is very stable. Alignment of this portion of the receiver is not recommended in the field.

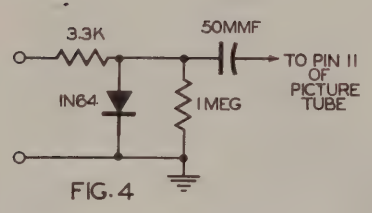


FIG. 4

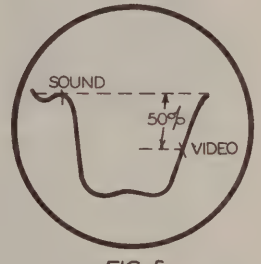
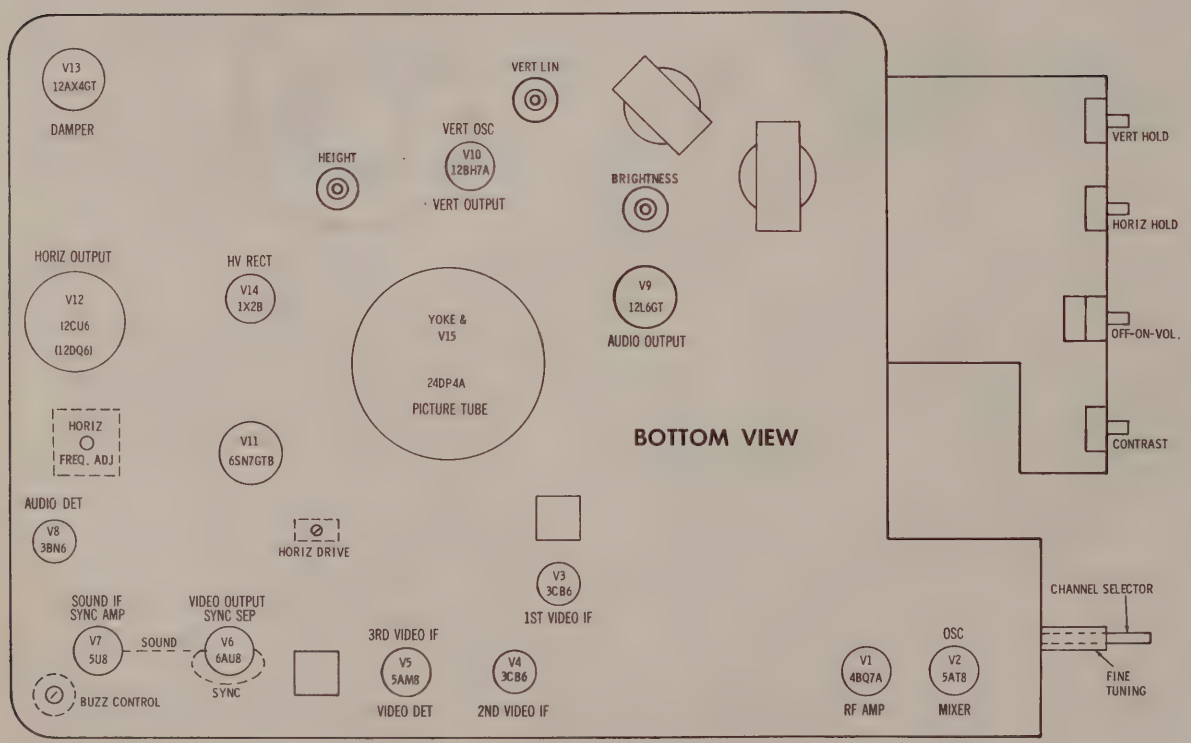


FIG. 5

RESISTANCE MEASUREMENTS

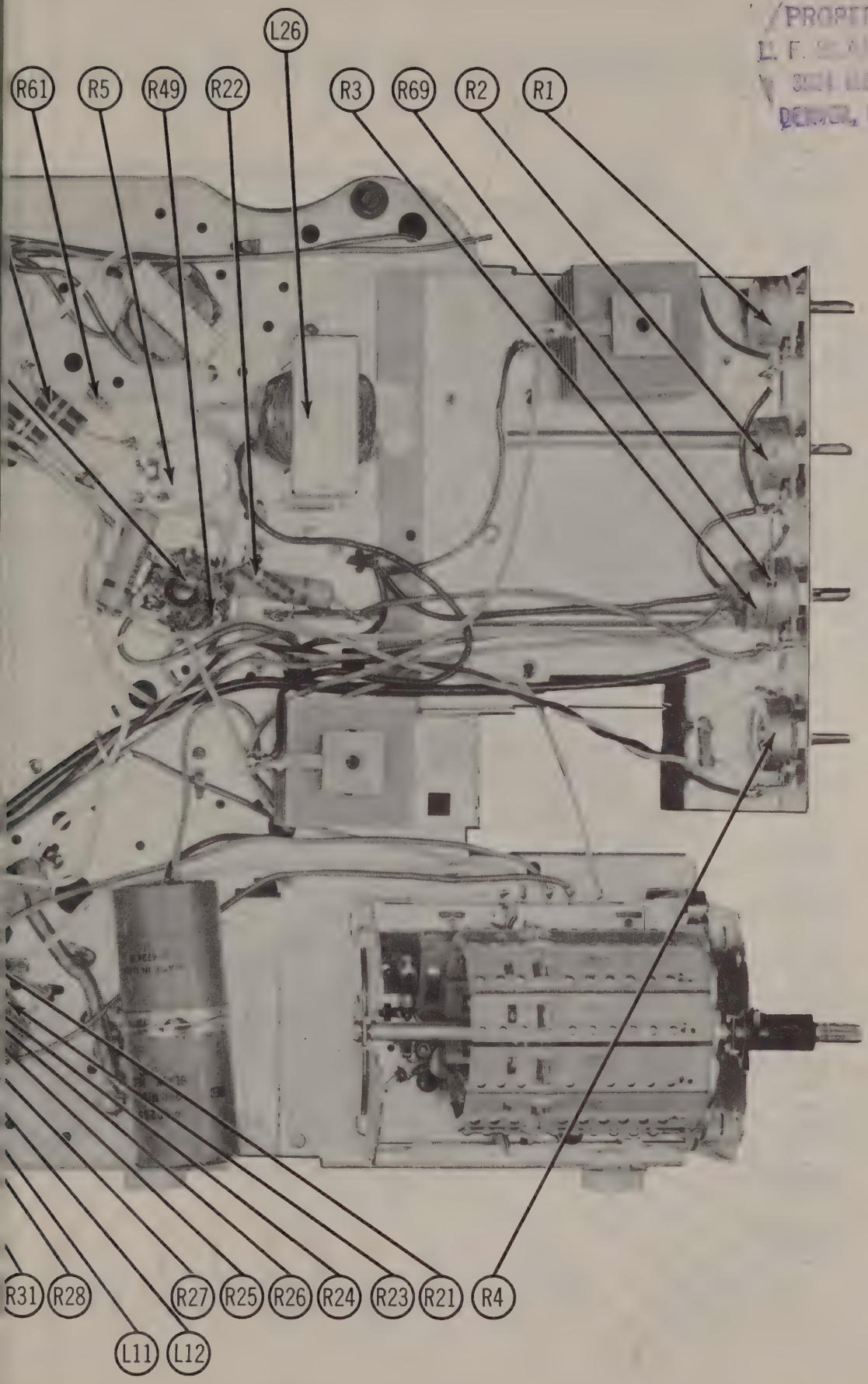
Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V 1	4BQ7A	INF	1Meg	0Ω	12Ω	13Ω	† 2. 2KΩ	300KΩ	INF	0Ω
V 2	5AT8	10KΩ	■ 4KΩ	0Ω	11Ω	12Ω	■ 15KΩ	■ 47KΩ	0Ω	220KΩ
V 3	3CB6	1Meg	47Ω	11Ω	10Ω	■ 1. 2KΩ	■ 1. 2KΩ	0Ω		
V 4	3CB6	1Meg	47Ω	10Ω	9Ω	■ 1KΩ	■ 1KΩ	0Ω		
V 5	5AM8	180Ω	12KΩ	■ 1KΩ	9Ω	8Ω	■ 1KΩ	. 2Ω	5. 6KΩ	0Ω
V 6	6AU8	0Ω	2. 2Meg	■ 1Meg	7Ω	8Ω	100Ω	1Meg	† 47KΩ	† 7. 5KΩ
V 7	5U8	■ 12KΩ	2. 9Ω	■ 18KΩ	7Ω	6Ω	■ 18KΩ	150Ω	0Ω	47KΩ
V 8	3BN6	300Ω	3. 4Ω	6Ω	5Ω	■ 5. 6KΩ	5. 3Ω	† 330KΩ		
V 9	12L6GT	TP	15Ω	† 265Ω	† 55Ω	250KΩ	TP	13Ω	130KΩ	
V 10	12BH7A	▲ 1. 3KΩ	▲ 2. 5Meg	7KΩ	5Ω	5Ω	▲ 2. 5Meg	500KΩ	0Ω	3Ω
V 11	6SN7GTB	750KΩ	† 60KΩ	300KΩ	250KΩ	† 28KΩ	0Ω	3Ω	2Ω	
V 12	12CU6	TP	15Ω	NC	† 12KΩ	390KΩ	NC	18Ω	0Ω	TOP CAP ▲ 22Ω
V 13	12AX4GT	NC	TP	250KΩ	NC	† 55Ω	NC	18Ω	22Ω	
V 14	1X2B		PINS	1-8	HAVE	INF	RESISTANCE			TOP CAP ▲ 190Ω
V 15	24DP4A	0Ω	0Ω	PIN 6 130KΩ	PIN 10 ▲ 390KΩ	PIN 11 ■ 300KΩ	PIN 12 2Ω			

† MEASURED FROM POSITIVE SIDE OF C3A.
■ MEASURED FROM 145V LINE.
▲ MEASURED FROM PIN 3 OF V13.
TP-TIE POINT.
NC-NO CONNECTION.

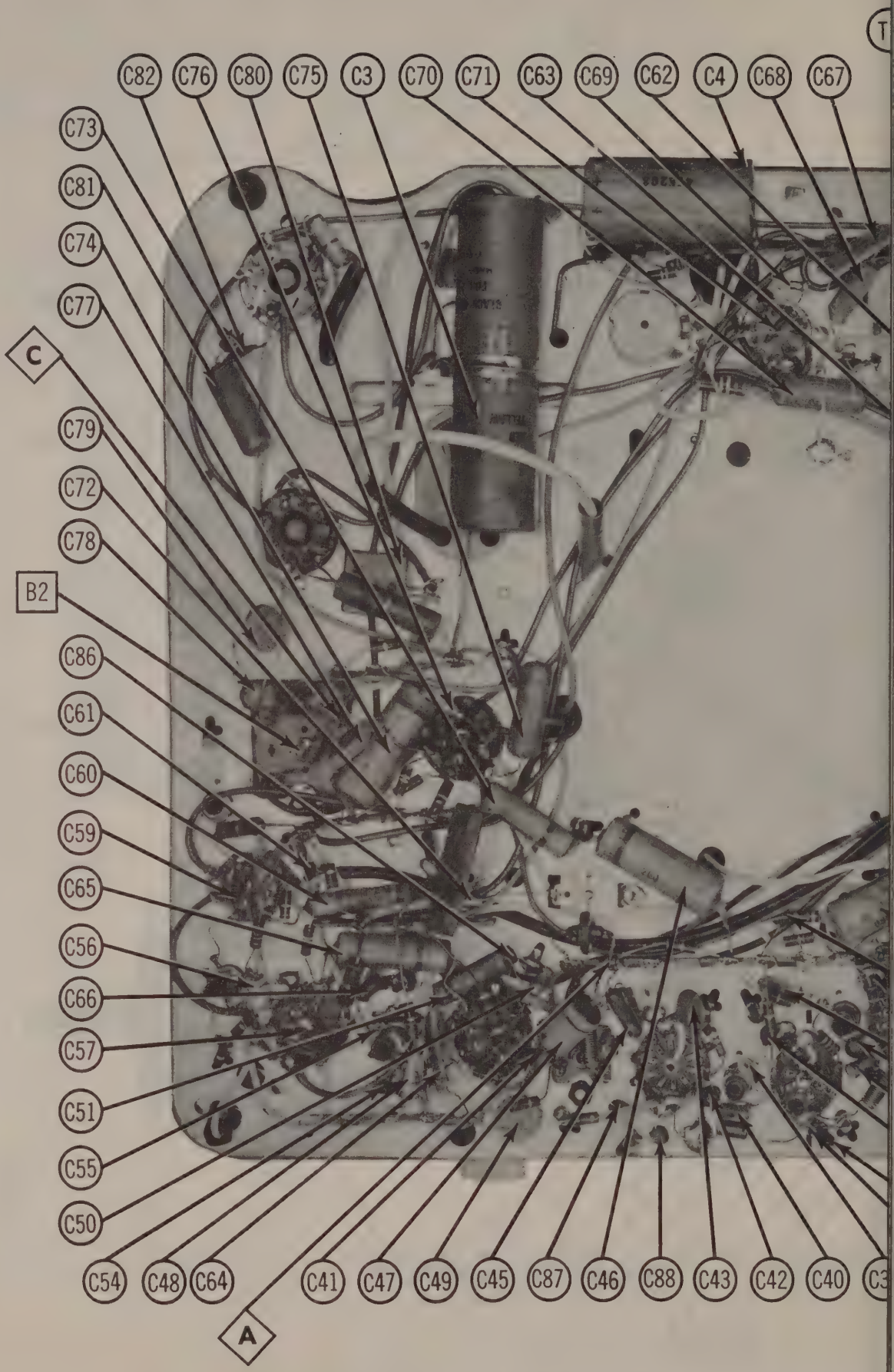


TUBE PLACEMENT CHART

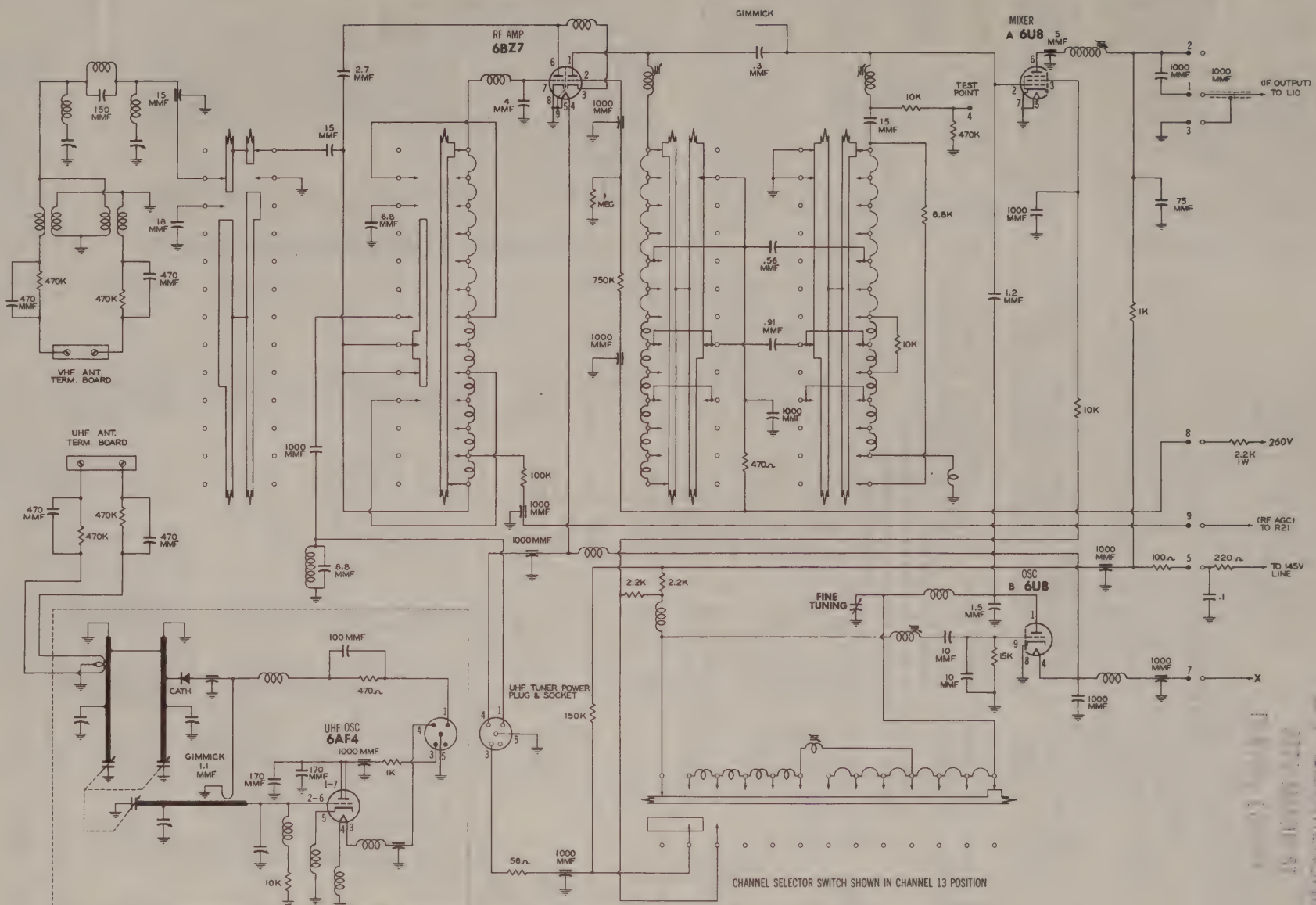
PROPERTY OF
L. F. [illegible]
[illegible] BLVD.
DENVER, COLORADO



AND INDUCTOR IDENTIFICATION



CHASSIS BOTTOM VIEW-CAPACITO



A PHOTOFACT STANDARD NOTATION SCHEMATIC

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UHF-VHF TUNER PART NO. ID2283 USED WITH CHASSIS D 2001D

ALTERNATE VHF-UHF TUNER SCHEMATIC

HALLICRAFTERS MODELS 24TS610B, M, 24TS611B, M (Ch. C2001B, D2001D)

PARTS LIST AN

TUBES (GENERAL ELECTRIC, SYLVANIA)

ITEM No.	USE	TYPE	NOTES
V1	RF Amplifier	4BQ7A	
V2	Mixer-Oscillator	5AT8	
V3	1st. Video IF Amplifier	3CB6	
V4	2nd. Video IF Amplifier	3CB6	
V5	3rd. Video IF Amplifier-Video Detector	5AM8	
V6	Video Output-Sync Sep.	6AU8	
V7	Sound IF Amp.-Sync Amp.	5U8	

ITEM No.	USE	TYPE	NOTES
V8	Audio Detector	3BN6	
V9	Audio Output	12L6GT	
V10	Vert. Osc.- Vert. Output	12BH7A	
V11	Horiz. AFC-Horiz. Osc.	6SN7GTB	
V12	Horiz. Output	12CU6	Note 1
V13	Damper	12AX4GT	
V14	HV Rectifier	1X2B	

Note 1. 12DQ6GT may be used in some versions.

PICTURE TUBE

ITEM No.	REPLACEMENT DATA				NOTES
	Hallicrafters PART No.	CBS PART No.	GENERAL ELECTRIC PART No.	SYLVANIA PART No.	
V15	24DP4A ①	24DP4A ①	24DP4A	24DP4A ②	① Aluminized ② Silver screen "85"

ELECTROLYTIC CAPACITORS

ITEM No.	RATING		REPLACEMENT DATA					
	CAP.	VOLT.	Hallicrafters PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SANGAMO PART No.	SPRAGUE PART No.
C1	200	150	45B245	PR2-100	E210408	WS342	TD-200-200	S-110	R2108
C2A	140	300	45B243	PR4-100	E210401	WQ505	CDB-1008	Q-162	R1553
B	200	150							
C	5	300							
D	30	150							
C3A	200	200	45B312	E59H330	EZ60399	WD345	TD-200-200	D-100	R2063
B	5	200					TD-8-250	MT-2504	
C4	20	450	45B208	PRS450V20	BR2045	TC75	TD-20-450	FM-4520	TVA-1709

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING		REPLACEMENT DATA							NOTES
	CAP.	VOLT	Hallicrafters PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	
C5	470	500	47X20B471M	1468-00047	D6-471	5W5Q47	GP2K-471	MCK347	MS-347	
C6	470	500	47X20B471M	1468-00047	D6-471	5W5Q47	GP2K-471	MCK347	MS-347	
C7	120			NP0-DI120	DD-121	TZ32	811-121		5TCC-T12	
C8	5			NP0-DI5	TCZ-4R7	TZ07	NP0A-050	ZT-555	5TCCB-V47	
C9	6.8			NP0-DI6.8	TCZ-6R8	TZ08	NP0A-6R8	ZT-5568	5TCCB-V68	
C10	6.8			NP0-DI6.8	TCZ-6R8	TZ08	NP0A-6R8	ZT-5568	5TCCB-V68	
C11	3			NP0-DI3	TCZ-3R3	TZ06	NP0A-030	ZT-553	5TCCB-V33	
C12	3-12						3139-01-0R5	CT565A		
C13	800									
C14	2.2			NP0-SI2.2	TCZ-2R2	TZ05	NP0A-2R2		5TCCB-V22	
C15	1000			BPD-001	DD-102	K069	801-001	DC-521	5HK-D1	
C16	1.5			NP0-SI1.5	TCZ-1R5	TZ04	NP0A-1R5	ZT-5515	5TCCB-V15	
C17	.5-3				829-3		3139-01-0R5	CT565A		
C18	800									
C19	.5-3				829-3		3139-01-0R5	CT565A		
C20	1			NP0-SI1	TCZ-1	TZ03	NP0A-010	ZT-5515	5TCCB-V1	
C21	10									
C22	10									
C23	43				TCZ-43	TZ21	NP0L-430			
C24	1000			BPD-001	DD-102	K069	801-001	DC-521	5HK-D1	
C25	800									
C26	800									
C27	1000			BPD-001	DD-102	K069	801-001	DC-521	5HK-D1	
C28	1000			BPD-001	DD-102	K069	801-001	DC-521	5HK-D1	
C29	1000			BPD-001	DD-102	K069	801-001	DC-521	5HK-D1	
C30	1000			BPD-001	DD-102	K069	801-001	DC-521	5HK-D1	
C31	800									
C32	800									
C33	5000		47A168	BPD-000033	DD-502	K080	811-005	DC-525	5HK-D5	
C34	.1	400	46AU104J	P488N-1	DF-104	CUB4P1		PT401	4TM-P1	
C35	1000		47A230	BPD-001	DD-102	K069	801-001	DC-521	5HK-D1	
C36	24		47CA20A240J	NP0-SI25	TCZ-24	TZ15	NP0L-240	ZT-5425	5TCC-Q25	
C37	5000		47A168	BPD-005	DD-502	K080	811-005	DC-525	5HK-D5	
C38	1000		47A230	BPD-001	DD-102	K069	801-001	DC-521	5HK-D1	
C39	39			NP0-SI39	TCZ-39	TZ20	NP0L-390		5TCC-Q39	
C40	24		47CA20A240J	NP0-SI25	TCZ-24	TZ15	NP0L-240	ZT-5425	5TCC-Q25	
C41	1000		47A230	BPD-001	DD-102	K069	801-001	DC-521	5HK-D1	
C42	1000		47A230	BPD-001	DD-102	K069	801-001	DC-521	5HK-D1	
C43	5000		47A168	BPD-005	DD-502	K080	811-005	DC-525	5HK-D5	
C44	1000		47A230	BPD-001	DD-102	K069	801-001	DC-521	5HK-D1	
C45	10		47A160	N750-SI10	TCN-10	TN01	N750A-100	NT-541	5TCU-Q1	
C46	.25	200	46AT254J	P288N-25		CUB2P25		PT4025	2TM-P25	
C47	.1	150	46A243	P288N-1	DF-104	CUB2P1		PT401	2TM-P1	
C48	68									
C49	20000		47A242	BPD-02	DD-203	K085	817-02		5HK-S2	
C50	270		47CA20A271K	NP0-SI270	TCZ-270	TZ40	NP0-335-271		MS-327	
C51	.0082	200	46AU822E	1467-0082	DD16-802	1D3D82		PT1628	6TM-D8	
C52	560		47CA25	1469-00056	D6-561	1R5T56			MS-356	
C53	.1	400	46AV104J	P488N-1	DF-104	CUB4P1		PT401	4TM-P1	
C54	10		47CA20100F	[illegible]	D6-100	TP09	GP1K-100	UC-541	5GA-Q1	
C55	33		47B478	Np80-SI33						
C56	33		47B478	Np80-SI33						
C57	5000		47A168	BPD-005	DD-502	K080	811-005	DC-525	5HK-D5	
C58	15		47B480							
C59	5000		47A168	BPD-005	DD-502	K080	811-005	DC-525	5HK-D5	
C60	.01	200	46AU103J	BPD-01	D6-103	CUB2S1	GP3-333-103	PT411	4TM-S1	
C61	1000		47A230	BPD-001	DD-102	K069	801-001	DC-521	5HK-D1	
C62	.02	200	46AU203J	BPD-02	DF-203	CUB2S2	817-02	PT412	2TM-S2	
C63	.02	600	46AZ203J	BPD-02	DF-203	CUB6S2	817-02	PT612	6TM-S2	
C64A	270					G054	GP2K-271	UC-5327	5GA-T27	
B	10000		†49A046	†PA-553	†PC-263	K082	GP3-333-103	DC-511	5HK-S1	
C	25					G026	GP1K-250	UC-5425	5GA-Q25	
C65	.05	200	46AU503J	BPD-05	DF-503	CUB2S5		PT415	2TM-S5	
C66	33		47B478	SI33	D6-330	TP27	GP1K-330	UC-5433	5GA-Q33	
C67A	4700		♦49A044	♦PA-383-2	♦PC-106	K079	811-0047	UC-5247	♦101C12	
B	4700					K079	811-0047	UC-5247		
C68	.01	400	46BR103E4	BPD-01	D6-103	CUB4S1	GP3-333-103	PT411	4TM-S1	
C69	470		47CA2047IK	1464-00047	D6-471	5R5T47	811-471		MS-347	
C70	.047	400	46BR473E4	BPD-05	DF-503	CUB4S47		PT4147	4TM-S47	
C71	5000		47A168	BPD-005	DD-502	K080	811-005	DC-525	5HK-D5	
C72	20			NP0-SI20	TCZ-20	TZ13	831-200	ZT-542	5TCC-Q2	
C73	.02	200	46AU203J	BPD-02	DF-203	CUB2S5	817-02	PT412	2TM-S2	
C74	.25	200	46AT254J	P288N-25		CUB2P25		PT4025	2TM-P25	
C75	.047	400	46BR473	BPD-05	DF-503	CUB4S47		PT4147	4TM-S47	
C76	33		47CA20A330M	NP80-SI33						
C77	220	500	47X20B221K	1469-00022	TCZ-220	22R5T22	NP0-335-221		MS-322	

ITEM No.	RATING		REPLACEMENT DATA		NOTES
	CAP.	VOLT	Hallicrafters PART No.	AEROVOX PART No.	
C78	.01	400	46C244	BPD-01	D6-103
C79	20000		46BR223L4	BPD-02	DD-203
C80	1300	500	47X30BI32K	1464-0013	
C81	.047	400	46BR473L4	BPD-05	DF-503
C82	10000		47A224	BPD-01	DD-103
C83	56	3000	47A555		
C84	.08	200	46AU803F	P288N-075	DF-753
C85	68	2000			
C86	1000		47A230	BPD-001	DD-102
C87	1000		47A230	BPD-001	DD-102
C88	1000		47A230	BPD-001	DD-102
C89	1000		47A230	BPD-001	DD-102
C90	1000		47A230	BPD-001	DD-102
C91	1000		47A230	BPD-001	DD-102
C92	1000		47A230	BPD-001	DD-102

† Items C64A, C64B, C64C, R52A and R52B are combined in
♦ Items C67A, C67B, R58A and R58B are combined in one uni

CONT

ITEM No.	RATING		REPLACEMENT		
	RESISTANCE	WATTS	Hallicrafters PART No.	CENTRALAB PART No.	CLAROST PART N
R1A	1.25Meg with 250K stop	1/2	25B1176	♦ B-69	♦A47-1Meg
B	Shaft		Not Req.	Not Req.	FS-3
R2A	145KΩ with 75KΩ stop	1/2	25B1100	† B-35	†A47-75K
B	Shaft		Not Req.	Not Req.	FS-3
R3A	330KΩ	1/2	25B1101	B-60-S	A47-500K
B	Shaft		Not Req.	Not Req.	FS-3
C	Switch		Not Req.	Not Req.	SWE-12
R4	1000Ω	1/2	25B1225		
R5A	5Meg	1/2	25B1096		
B	Shaft		Not Req.		
R6A	750Ω	1/2	25B1099	AB-5	A47-750-S
B	Shaft		Not Req.	AK-19	RN-3
R7A	5Meg with 1Meg stop	1/2	25H100	■ AB-86	■A47-4Meg
B	Shaft		Not Req.	AK-19	RN-3
R8	500Ω	2	25A1095		39-500

♦ Connect a 270KΩ resistor in series with the left hand termina of the original control (control viewed from shaft end, termin
† Connect a 68KΩ resistor in series with the right hand termina of the original control (control viewed from shaft end termin
■ Connect a 1Meg resistor in series with the right hand termina of the original control (control viewed from shaft end, termin

RESIST

All wattages 1/2 watt, or less,

ITEM No.	RATING		REPLACEMENT DATA		NOTES
	OHMS	WATT	Hallicrafters PART No.	IRC PART No.	
R9	470KΩ		23X20X474K	BTS-470K	
R10	470KΩ		23X20X474K	BTS-470K	
R11	680KΩ			BTS-680K	
R12	4700Ω			BTS-4700	
R13	820KΩ			BTS-820K	
R14	470KΩ			BTS-470K	
R15	220KΩ			BTS-220K	
R16	10KΩ			BTS-10K	
R17	10KΩ			BTS-10K	
R18	3900Ω			BTS-3900	
R19	15KΩ			BTS-15K	
R20	47KΩ			BTS-47K	
R21	1000Ω		23X20X102K	BTS-1000Ω	
R22	2200Ω	1	23X30X222K	BTA-2200	
R23	4700Ω		23X20X472K		
R24	4700Ω		23X20X472K	BTS-4700	
R25	1000Ω		23X20X102K	BTS-1000	
R26	47Ω		23X20X470K	BTS-47	
R27	220Ω		23X20X221K	BTS-220	
R28	18KΩ		23X20X183K		
R29	1000Ω		23X20X102K	BTS-1000	
R30	1000Ω		23X20X102K	BTS-1000	
R31	47Ω		23X20X470K	BTS-47	
R32	12KΩ		23X20X123K	BTS-12K	
R33	1000Ω		23X20X102K	BTS-1000	
R34	1000Ω		23X20X102K	BTS-1000	
R35	180Ω		23X20X181K	BTS-180	
R36	1Meg		23X20X105K	BTS-1Meg	
R37	5600Ω		23X20X562K	BTS-5600	
R38	1Meg		23X20X105K	BTS-1Meg	
R39	7500Ω	5	24A1058	PW7-7500	
R40	47KΩ	1	23X30X473K	BTA-47K	
R41	56Ω		23X20X560K	BTS-56	
R42	100KΩ		23X20X104K	BTS-100K	
R43	390KΩ		23X20X394K	BTS-390K	
R44	820KΩ		23X20X824K	BTS-820K	
R45	18KΩ		23X20X183K	BTS-18K	
R46	150Ω		23X20X151K	BTS-150	

Note 1. Used in chassis A2001
† Items R52A, R52B, C64A, C6
♦ Items R58A, R58B, C67A, C6

TRANSFORMERS (S

ITEM No.	USE	Hallicrafters PART No.	Halldorson PART No.	Merit PART N
T1	Vert. Osc. Trans.	55B250	B6704	A-3006
T2	Horiz. Output Trans.	55-274	FB418*	HV0-37*
T3	Vert. Output Trans.	55C260	Z1807	A-2824
T4A	Yoke 90°Horiz (21MH)	53-364	DF607①	MDF-92
B	Vert. (36MH)		②	

① Use original horizontal damping network.
② Jumper terminals #3 and #8.

PARTS LIST AND DESCRIPTIONS

TUBES (GENERAL ELECTRIC, SYLVANIA)

ITEM No.	USE	TYPE	NOTES
V1	RF Amplifier	4BQ7A	
V2	Mixer-Oscillator	6AT8	
V3	1st. Video IF Amplifier	3CB6	
V4	2nd. Video IF Amplifier	3CB6	
V5	3rd. Video IF Amplifier-Video Detector	5AM6	Note 1
V6	Video Output-Sync Sep.	6AU8	
V7	Sound IF Amp.-Sync Amp.	5U8	

Note 1. 1DQ6GT may be used in some versions.

ITEM No.	USE	TYPE	NOTES
V8	Audio Detector	3BN6	
V9	Audio Output	12L6GT	
V10	Vert. Osc.- Vert. Output	12BH7A	
V11	Horiz. AFC-Horiz. Osc.	6SN7GTB	
V12	Horiz. Output	12CU6	
V13	Damper	12AX4GT	
V14	HV Rectifier	1X2B	

PICTURE TUBE

ITEM No.	REPLACEMENT DATA				NOTES
	Hallicrafters PART No.	CBS PART No	GENERAL ELECTRIC PART No.	SYLVANIA PART No.	
V15	34DP4A ①	34DP4A ①	34DP4A	34DP4A ②	① Aluminized ② Silver screen "65"

ELECTROLYTIC CAPACITORS

ITEM No.	RATING		REPLACEMENT DATA						
	CAP	VOLT	Hallicrafters PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SANGAMO PART No.	SPRAGUE PART No.
C1	200	150	46B369	PRH-200	EZH200	WS343	TD-300-300	S-100	R3108
C2	160	500	45B365	PRM-160	EZH160	WQ606	CDB-1006	Q-368	R1553
B	200	150							
C	5	200							
D	30	150							
C3A	200	150	46B313	E99B330	EZ60B99	WD646	TD-300-300	D-100	R3063
B	5	200					TD-5-350	MT-3804	
C4	20	450	45B308	PRH450V20	HR3045	TC78	TD-20-450	FM-4520	TVA-1709

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING		REPLACEMENT DATA							
	CAP.	VOLT	Hallicrafters PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	NOTES
C5	470	500	47X20B471LM	1468-00047	DS-471	5W5Q47	GP2K-471	MCE347	MS-347	
C6	470	500	47X20B471LM	1468-00047	DS-471	5W5Q47	GP2K-471	MCE347	MS-347	
C7	180			NPO-DI180	DD-181	DD-181	811-151		811-151	
C8	5			NPO-DI5	TCZ-4R7	TZ07	MPGA-050	ZT-555	5TCCB-V47	
C9	6.8			NPO-DI6.8	TCZ-6R8	TZ08	MPGA-6R8	ZT-5568	5TCCB-V68	
C10	6.8			NPO-DI6.8	TCZ-6R8	TZ08	MPGA-6R8	ZT-5568	5TCCB-V68	
C11	3			NPO-DI3	TCZ-3R3	TZ06	MPGA-030	ZT-553	5TCCB-V33	
C12	3-12						3139-01-025	CT565A		
C13	500									
C14	2.2			NPO-SH2.2	TCZ-2R2	TZ05	MPGA-2R2		5TCCB-V22	
C15	1000			BPD-001	DD-103	DD69	801-001	DC-521	5HK-D1	
C16	1.5			NPO-SH1.5	TCZ-1R5	TZ04	MPGA-1R5	ZT-5515	5TCCB-V15	
C17	.5-3				SZS-3		3139-01-025	CT565A		
C18	500									
C19	.5-3				SZS-3		3139-01-025	CT565A		
C20	1			NPO-SH	TCZ-1	TZ03	MPGA-010	ZT-5615	5TCCB-V1	
C21	10									
C22	10									
C23	68				TCZ-4S	TZ31	MP0L-430			
C24	1000			BPD-001	DD-103	DD69	801-001	DC-521	5HK-D1	
C25	500									
C26	500									
C27	1000			BPD-001	DD-103	DD69	801-001	DC-521	5HK-D1	
C28	1000			BPD-001	DD-103	DD69	801-001	DC-521	5HK-D1	
C29	1000			BPD-001	DD-103	DD69	801-001	DC-521	5HK-D1	
C30	1000			BPD-001	DD-103	DD69	801-001	DC-521	5HK-D1	
C31	500									
C32	500									
C33	5000		47AJ68	BPD-000033	DD-502	KD80	811-005	DC-535	5HK-D5	
C34	.1	400	46AU1047	P48N-1	DF-104	CU34P1		PT401	4TM-P1	
C35	1000		47AJ20	BPD-001	DD-102	KD69	801-001	DC-521	5HK-D1	
C36	24		47CA20A240J	NPO-SH25	TCZ-24	TZ15	NP0L-240	ZT-5425	5TCC-Q25	
C37	5000		47AJ68	BPD-005	DD-502	KD80	811-005	DC-535	5HK-D5	
C38	1000		47AJ20	BPD-001	DD-103	KD69	801-001	DC-521	5HK-D1	
C39	39			NPO-SH39	TCZ-39	TZ30	NP0L-390	ZT-5435	5TCC-Q39	
C40	24		47CA20A240J	NPO-SH25	TCZ-24	TZ15	NP0L-240	ZT-5425	5TCC-Q25	
C41	1000		47AJ20	BPD-001	DD-103	KD69	801-001	DC-521	5HK-D1	
C42	1000		47AJ20	BPD-001	DD-103	KD69	801-001	DC-521	5HK-D1	
C43	5000		47AJ68	BPD-005	DD-502	KD80	811-005	DC-535	5HK-D5	
C44	1000		47AJ20	BPD-001	DD-102	KD69	801-001	DC-521	5HK-D1	
C45	10		47AJ60	NT50-SH10	TCH-10	TW01	NT50A-100	NT-541	5TCU-Q1	
C46	.35	300	47AJ54	P268N-35		CU32P25		PT6035	3TM-P25	
C47	.1	150	46A243	P38N-1	DF-104	CU38P1		PT401	3TM-P1	
C48	500									
C49	39000		47AJ42	BPD-03	DD-303	KD85	817-02		5HK-S2	
C50	270		47CA30A271K	NPO-SH270	TCZ-270	TZ40		MP0-335-271	MS-327	
C51	.0082	300	46AU8932	1467-0063	DD36-303	DD1263		PT6028	6TM-D6	
C52	560		47CA35	1469-00056	DS-561		1R5756		MS-356	
C53	.1	400	46AV1042	P48N-1	DF-104	CU34P1		PT401	4TM-P1	
C54	10		47CA3100F	SZ50	D6-100	TP09	GP1K-100	UC-541	5GA-Q1	
C55	33		47B478	Np80-SL33						
C56	33		47B478	Np80-SL33						
C57	5000		47AJ68	BPD-005	DD-502	KD80	811-005	DC-535	5HK-D5	
C58	15		47B450							
C59	5000		47AJ68	BPD-005	DD-502	KD80	811-005	DC-535	5HK-D5	
C60	.01	200	46AU1037	BPD-01	D6-103	CU3S81		GP3-333-103	PT411	4TM-S1
C61	.02	200	46A2391	BPD-01	DD-203	KD69		801-001	DC-521	5HK-D1
C62	.03	200	46AU1037	BPD-02	D6-303	CU3S83		817-03	PT413	5TM-S2
C63	.01	600	46A2383J	BPD-02	DF-303	CU3S81		GP2K-271	PT411	4TM-S1
C64A	370						C064	GP2K-271	UC-5337	5GA-Y27
B	10000		†49A046	†PA-553	†PC-265		K062	GP3-333-103	DC-511	5HK-S1
C	35						C026	GP2K-350	UC-5415	5GA-Q26
C65	.05	300	46AU5037	BPD-05	DF-503		CU3S85		PT415	3TM-S5
C66	15		47B478	SZ33	D6-330		YP27	GP1K-330	UC-5433	5GA-Q33
C67A	4700		49AA044	†PA-383-3	†PC-106		K079	811-0047	UC-5347	4HK-U3
B	4700						K079	811-0047	UC-5347	
C68	.01	600	46BR1037S4	BPD-01	D6-103		CU34P1	GP3-333-103	PT411	4TM-S1
C69	470		47CA30471K	1464-00047	DS-471		5R574T	811-471		MS-347
C70	.047	400	46BR473S4	BPD-05	DF-503		CU34S47		PT4147	4TM-S47
C71	5000		47AJ68	BPD-005	DD-502		KD80	811-005	DC-535	5HK-D5
C72	20			NPO-SH20	TCZ-20		TZ13	831-300	ZT-542	5TCC-Q2
C73	.02	300	46AU2037	BPD-02	DF-303		CU3S83	817-02	PT413	3TM-S2
C74	.33	200	46A7354J	P268N-35			CU32P25		PT6025	2TM-P25
C75	.047	400	46BR473	BPD-05	DF-503		CU34S47		PT4147	4TM-S47
C76	33		47CA30A330M	N080-SL33						
C77	330	500	47X30B331K	1469-00022	TCZ-330	3ZS1T22		MPG-335-331		MS-323

PARTS LIST AND DESCRIPTIONS

CAPACITORS (cont)

ITEM No.	RATING		REPLACEMENT DATA							NOTES
	CAP.	VOLT	Hallicrafters PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	
C78	.01	400	46C544	BPD-01	D6-103	CU3S81	GP3-333-103	PT411	4TM-S1	
C79	20000		46BR223L4	BPD-02	DD-203	KD85	817-03	PT412	5HK-S2	
C80	1300	500	47X30B132K	1464-00013		1R5D13			MS-213	
C81	.047	400	46BR473L4	BPD-05	DF-503	CU34S47		PT4167	4TM-S47	
C82	10000		47AJ24	BPD-01	DD-103	DD-103	811-01	DC-511	5HK-S1	
C83	56	1000	47AJ55						30GA-Q6	
C84	.01	200	46AU1037F	P268N-075	DF-753	CU32P1		PT401	2TM-P1	
C85	68	2000							20GA-Q68	
C86	1000		47AJ20	BPD-001	DD-103	KD69	801-001	DC-521	5HK-D1	
C87	1000		47AJ20	BPD-001	DD-103	KD69	801-001	DC-521	5HK-D1	
C88	1000		47AJ20	BPD-001	DD-103	KD69	801-001	DC-521	5HK-D1	
C89	1000		47AJ20	BPD-001	DD-103	KD69	801-001	DC-521	5HK-D1	
C90	1000		47AJ20	BPD-001	DD-103	KD69	801-001	DC-521	5HK-D1	
C91	1000		47AJ20	BPD-001	DD-103	KD69	801-001	DC-521	5HK-D1	
C92	1000		47AJ20	BPD-001	DD-103	KD69	801-001	DC-521	5HK-D1	

† Items C84A, C64B, C64C, R35A and R35B are combined in one unit.
♦ Items C67A, C67B, R58A and R58B are combined in one unit.

CONTROLS

ITEM No	RATING		REPLACEMENT DATA					INSTALLATION NOTES
	RESIST ANCE	WATTS	Hallicrafters PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	IRC PART No.	MALLORY PART No.	
R1A	1.25Meg with 250K stop	½	25B1176	♦ B-89	♦A47-1Meg-S	♦ Q11-157	♦ TA16L	Vertical Hold
B	Shaft		Not Req.	Not Req.	FS-3	Not Req.	Not Req.	Attach to R1A.
R2A	145KΩ with 75KΩ stop	½	25B1100	† B-35	†A47-75K-S	† Q11-155	† U-43	Horizontal Hold
B	Shaft		Not Req.	Not Req.	FS-3	Not Req.	Not Req.	Attach to R2A.
R3A	330KΩ	½	25B1101	B-60-S	A47-500K-2	Q13-132	TA334A	Volume
B	Shaft		Not Req.	Not Req.	FS-3	Not Req.	Not Req.	Attach to R3A.
C	Switch		Not Req.	Not Req.	SWS-12	T6-1	US-26	Attach to R3A. Contrast tapped at 200Ω
R4	1000Ω	½	25B1235					Brightness
R5A	1Meg	½	25B1096			QL7-141	PTA54R	Vertical Sync
B	Shaft		Not Req.			7Q	Not Req.	Attach to R5A.
R6A	750Ω	½	25B1099	AB-5	A47-750-S	QL1-305	PTA75L	Vertical Linearity
B	Shaft		Not Req.	AK-19	RM-3	7Q	Not Req.	Attach to R6A.
R7A	5Meg with 1Meg stop	½	25B1098	■ AB-86	■A47-5Meg-S	■Q11-141	■ PTA355L	Height
B	Shaft		Not Req.	AK-19	RM-3	TQ	Not Req.	Attach to R7A.
R8	500Ω	2	25A1097		B-500			Buss-Wire Wound

♦ Connect a 270KΩ resistor in series with the left hand terminal of the control and the lead connecting to the same terminal of the original control (control viewed from shaft end, terminals down).
† Connect a 68KΩ resistor in series with the right hand terminal of the control and the lead connecting to the same terminal of the original control (control viewed from shaft end terminals down).
■ Connect a 1Meg resistor in series with the right hand terminal of the control and the lead connecting to the same terminal of the original control (control viewed from shaft end, terminals down).

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING		REPLACEMENT DATA		NOTES
	OHMS	WATT	Hallicrafters PART No.	IRC PART No.	
R9	470Ω		23X20X470K	BTS-470K	
R10	470KΩ		23X20X474K	BTS-470K	
R11	680KΩ			BTS-680K	
R12	470KΩ			BTS-470K	
R13	820KΩ			BTS-820K	
R14	470KΩ			BTS-470K	
R15	220KΩ			BTS-220K	
R16	10KΩ			BTS-10K	
R17	10KΩ			BTS-10K	
R18	3900Ω			BTS-3900	
R19	15KΩ			BTS-15K	
R20	47KΩ			BTS-47K	
R21	1000Ω		23X20X102K	BTS-1000Ω	
R22	3300Ω	1	23X20X332K	BTA-330Ω	
R23	4700Ω		23X20X472K		
R24	4700Ω		23X20X472K	BTS-4700	
R25	2000Ω		23X20X102K	BTS-1000	
R26	47Ω		23X20X470K	BTS-47	
R27	330Ω		23X20X331K	BTS-330	
R28	18KΩ		23X20X183K		
R29	1000Ω		23X20X102K	BTS-1000	
R30	1000Ω		23X20X102K	BTS-1000	
R31	47Ω		23X20X470K	BTS-47	
R32	12KΩ		23X20X123K	BTS-12K	
R33	1000Ω		23X20X102K	BTS-1000	
R34	1000Ω		23X20X102K	BTS-1000	
R35	180Ω		23X20X181K	BTS-180	
R36	1Meg		23X20X105K	BTS-1Meg	
R37	1Meg		23X20X105K	BTS-1Meg	
R38	750Ω	5	24A1058	PWT-7500	
R40	47KΩ	1	23X30X473X	BTA-47K	
R41	56Ω		23X20X560K	BTS-56	
R42	100KΩ		23X20X104K	BTS-100K	
R43	390KΩ		23X20X394K	BTS-390K	
R44	820KΩ		23X20X824K	BTS-820K	
R45	1MΩ		23X20X105K	BTS-1M	
R46	150Ω		23X20X151K	BTS-150	

ITEM No.	RATING		REPLACEMENT DATA		NOTES
	OHMS	WATT	Hallicrafters PART No.	IRC PART No.	
R47	4700Ω		23X20X472K	BTS-4700	
R48	5800Ω	1	23X20X582K	BTA-5800	
R49	562KΩ 9%		23X20X564X	BTS-560K 9%	
R50	470KΩ 9%		23X20X474J	BTS-470K 9%	
R51	15KΩ		23X20X153X	BTS-15K	
R52A	220KΩ		† 49A046	BTS-220K	
B	2.2Meg			BTS-2.2Meg	
R53	1Meg		23X20X105X	BTS-1Meg	
R54	680KΩ		23X20X684X	BTS-680K	
R55	47KΩ		23X20X473X	BTS-47K	
R56	680Ω	1	23X30X682X	BTS-680	
R57	4700Ω			BTS-4700	
R58A	22KΩ		♦ 49A044	BTS-22K	
B	10KΩ			BTS-10K	
R59	680KΩ	1	23X30X472X	BTA-680K	
R60	15KΩ	2	23X40X153X	BTB-15K	
R61	68KΩ		23X20X683X	BTS-68K	
R62	15KΩ	2	23X40X153X	BTB-15K	
R63	330Ω				
R64	680Ω				
R65	5600Ω		23X20X564J		
R66	150KΩ		23X20X154X		
R67	150KΩ		23X20X154X		
R68	100KΩ		23X20X104X		
R69	100KΩ		23X20X104X		
R70	6300Ω		23X20X632X		
R71	27KΩ		23X20X273X	BTS-27K	
R72	150KΩ		23X20X154X		
R73	5.7Meg		23X20X575X		
R74	18KΩ		23X20X183X		
R75	390KΩ		23X20X394X		
R76	12KΩ	2	23A097		
R77	100Ω		23X20X101K		
R78	470Ω		23X20X471K		
R79	2.2Ω			BW½-2.2	
R80	1000Ω		23X20X102K	BTS-1000	
R81	43Ω	20	24A1048	BD-50	Note 1
R82	7.2Ω	5	25B101		

Note 1. Used in chassis A300I and C200I only.
† Items R52A, R52B, C67A, C67B are combined in one unit.
♦ Items R58A, R58B, C67A, C67B are combined in one unit.

TRANSFORMERS (SWEEP CIRCUITS)

ITEM No.	USE	REPLACEMENT DATA							
		Hallicrafters PART No.	Halldoron PART No.	Merit PART No.	RCA TYPE No	Ram PART No.	Stancor PART No.	Thordarson PART No	Triad PART No
T1	Vert. Osc. Trans.	53B350	B6704	A-3006		V405	A-8125	26A03	A-97X
T2	Horiz. Output Trans.	53-274	FB43S*	HVO-37*		X125*	A-8263*	F1X-25*	D-48*
T3	Vert. Output Trans.	53C350	Z1837	A-2824					
T4A	Yoke 90°Toriz (GLASS)	53-364	DF90T①	MDF-82②	236D①	Y90P19/43 ①	DY-16A①	Y-16①②	Y-41-K①②
	Vert. (59MM)		②		②	① ②			

① Use original horizontal damping network.
② Jumper terminals #3 and #6.

* HORIZONTAL OUTPUT TRANSFORMER CONNECTION DATA

Use Original Width Coil Unless Replacement Type Is Listed

ORIGINAL TERMINAL CONNECTIONS	Halldorson Replacement Connections	Merit Replacement Connections	RCA Replacement Connections	Ram Replacement Connections	Stancor Replacement Connections	Thordarson Replacement Connections	Triad Replacement Connections
4	6	6		3	6	6	6
5	3	3		7	3	3	3
2	5	5		2	5	5	5
6	2	2		6	2	2	2

TRANSFORMER (AUDIO OUTPUT)

ITEM No	IMPEDANCE	REPLACEMENT DATA						NOTES
		Hallicrafters PART No.		Halldorson PART No	Merit PART No	Stancor PART No	Thordarson PART No	Triad PART No
	PRI.	SEC.						
T5	2.2KΩ	3-4Ω	55B348		Z1101	A-3025	A-3332	24B50	S-11X

SPEAKER

ITEM No.	RATINGS			REPLACEMENT DATA			NOTES
	SIZE	FIELD	V. C. IMP.	Hallicrafters PART No.	QUAM PART No	RCA TYPE No	
SP1	4"	PM	3-4Ω	85C175	4A07	22381	

COILS (RF-IF)

ITEM No.	USE	DC RES.		REPLACEMENT DATA				NOTES
		PRI.	SEC.	Hallicrafters PART No.	MEISSNER PART No.	MERIT PART No.	MILLER PART No.	
L1	Ant. Matching Trans.	0Ω	0Ω					
L2	Ant. Matching Trans.	0Ω	0Ω					
L3	FM Trap	0Ω						
L4	IF Trap	.2Ω						
L5	Ant., RF Mixer Grid & Osc. Coils	0Ω						
L6	Fil. Choke	0Ω						
L7	Heat. Coil	0Ω						
L8	RF Coil	0Ω						
L9	Conv. Plate	.1Ω						
L10	1st. Video IF	.1Ω		51A1936				
L11	Fil. Choke	0Ω		53A382	19-3001		6178	.4 Microhenry
L12	2nd. Video IF	.1Ω		51A1938			6235	
L13	Fil. Choke	0Ω		53A382	19-3001		6178	.4 Microhenry
L14	3rd. Video IF	.1Ω		51A1948	17-4501	TV-132	6231 ♦	Includes 41.25Mc trap
L15	Fil. Choke	0Ω		53A382	19-3001		6178	.4 Microhenry
L16	4th. Video IF	.2Ω	.3Ω	50A654	17-5004 ■	TV-125 ■	6234 ■	
L17	Series Peaking Coil	4.3Ω		53A397	19-1006		6634	10 Microhenries
L18	Shunt Peaking Coil	9.7Ω		51-3031	19-4400		6134	390 Microhenries
L18A	4.5MC Trap	.9Ω		51A1996				
B	Int. Sound IF	3.9Ω						
L19	Shunt Peaking Coil	10.8Ω		51-3030	19-4400		6136	430 Microhenries
L21	Series Peaking Coil	6.3Ω		51-3029	19-3100 ▲	TV-154 ▲	6130 ▲	190 Microhenries, wound on 332Ω resistor
L22	2nd. Sound IF	1.7Ω	5.4Ω	51A1959				
L23	Quadrature Coil	5.3Ω		51A1957	19-1066		1680	7.5 Microhenries, IRC part #C1A
L24	RF Choke	5.3Ω		53-343				

* Use one winding only.
■ Use adaptor plate.
▲ Parallel with 332Ω resistor.

TRANSFORMER (HORIZ. OSC.)

ITEM No.	DC RES.		REPLACEMENT DATA							NOTES
	PRI.	SEC	Hallicrafters PART No.	MEISSNER PART No.	MERIT PART No.	MILLER PART No.	RCA TYPE No	Ram PART No	Thordarson PART No	
L25	17Ω	33Ω	50C648	30-1402 ♦	TV-M2♦	6183 ♦	305M1 ♦	H-100 ♦	H6-3 ♦	Waveform winding -340

♦ Reverse coil mounting in can.

FILTER CHOKE

ITEM No.	RATINGS		REPLACEMENT DATA					
	TOTAL DIRECT CURRENT	RESISTANCE	INDUCTANCE @ CURRENT 1000 (%)	Hallicrafters PART No	Halldorson PART No	Merit PART No	Stancor PART No	Thordarson PART No	Triad PART No
L26	.200ADC	85Ω	.85 HY	56B187	C5040	C3994	C3237	28C41	C-31X ①

① Drill one new mounting hole.

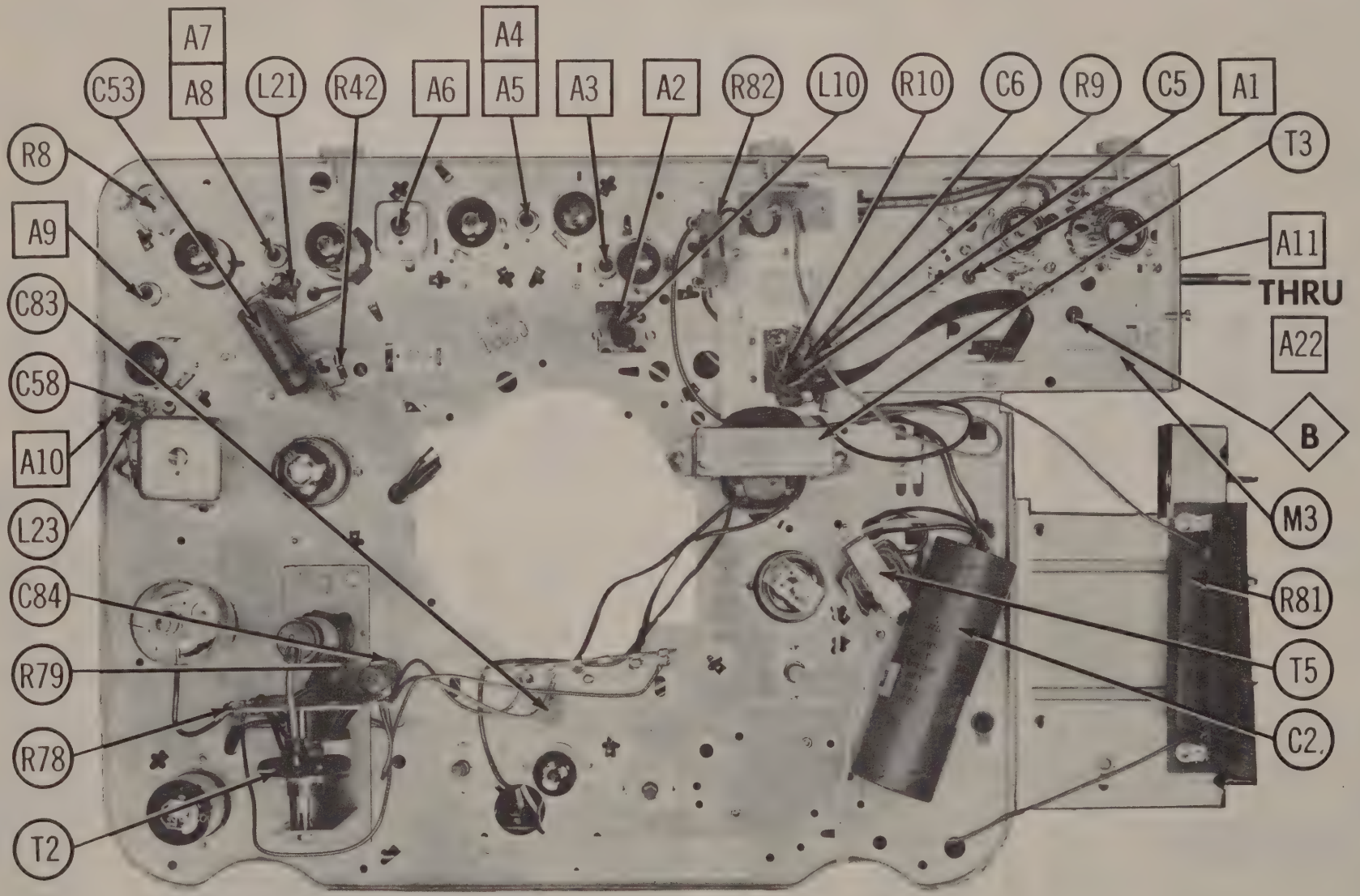
SELENIUM RECTIFIER

ITEM No.	RATING	REPLACEMENT DATA						NOTES
	CURRENT	Hallicrafters PART No.	FEDERAL PART No.	INTERNATIONAL PART No.	MALLORY PART No.	RADIO RECEPTOR PART No.	SARKES TARZIAN PART No.	
M1	.200ADC	27A218	1336A	MR300	6S300	6Q4	300	
M2	.200ADC	27A218	1336A	MR300	6S300	6Q4	300	

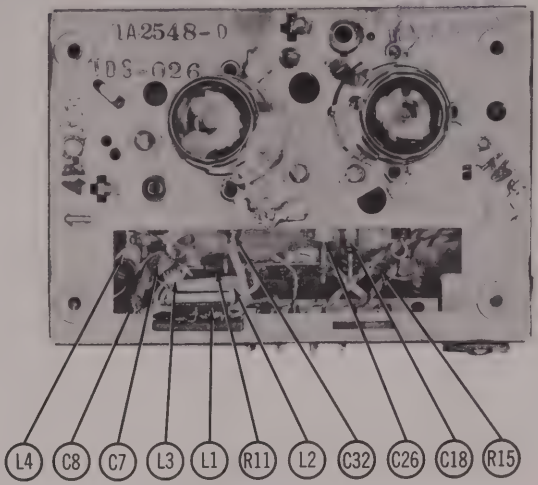
MISCELLANEOUS

ITEM No.	PART NAME	Hallicrafters PART No.	NOTES
M3	Tuner	1D2S48	VHF - Chassis C300D
M4	Tuner	1D2S23	VHF-UHF - Chassis D300D
M5	Centering Device	31B218	
M6	Ion Trap	31B189	
R5	Trimmer Cap.	44A448	Horiz. Lock (10-160MMF)
	Cabinet	78-1215	Models 24T861M, 24T861M
	Cabinet	78-1216	Models 24T861B, 24T861B
	[redacted]	7A611	
	Safety Glass	22A495	

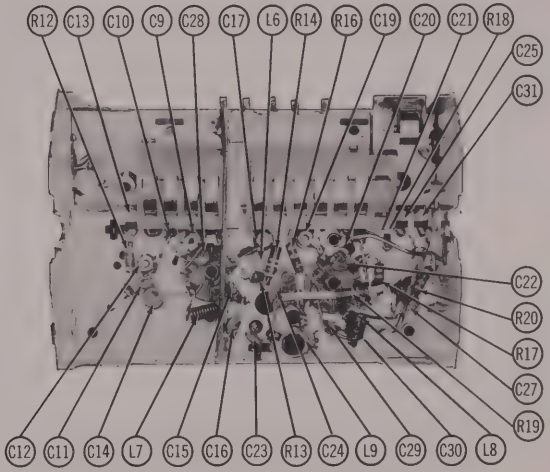
HALLICRAFTERS MODELS 24T5610B, M, 24T5611B, M (Ch. C2001D, D2001D)



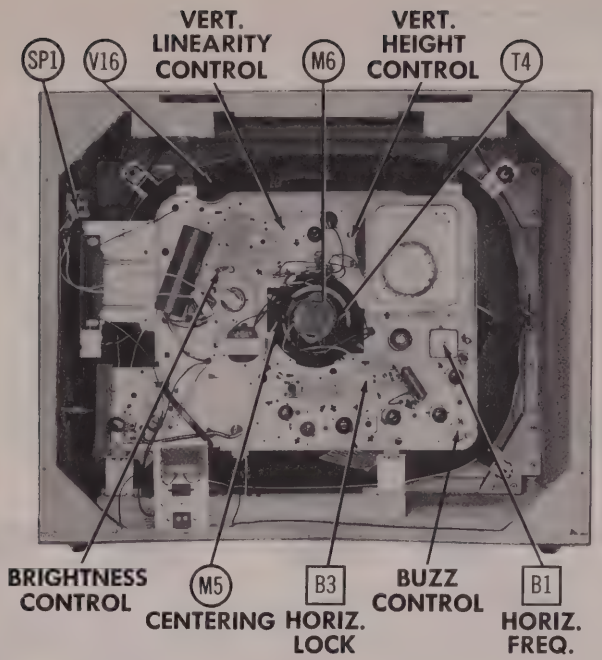
CHASSIS TOP VIEW



RF TUNER-TOP VIEW



RF TUNER-BOTTOM VIEW



CABINET—REAR VIEW

HORIZONTAL SWEEP CIRCUIT ADJUSTMENTS

Turn the set on and tune in a TV station.

Set the horizontal hold control to the center of its range. If necessary, adjust the horizontal frequency slug (B1) to synchronize the picture horizontally.

Connect the vertical amplifier of an oscilloscope thru a 10MMF capacitor to point Ⓟ. Low side to chassis. Adjust the horizontal waveform slug (B3) for a waveform similar to Fig. 6. If necessary, keep picture in sync during alignment with the horizontal hold control or B1.

Disconnect the scope. Turn the horizontal hold control fully counter clockwise. Turn B1 counter clockwise until the picture loses sync with diagonal bars sloping down to the right.

Adjust B1 clockwise until the picture is just ready to fall into sync. Turn the horizontal hold control clockwise until the picture loses sync. If picture is still in sync at maximum clockwise rotation of the horizontal hold control, switch off channel and back again so that picture will fall out of sync. Turn the horizontal hold control slowly counter clockwise and note the number of diagonal bars appearing just before the picture falls into sync. If more than three bars are present, adjust the horizontal lock trimmer (B3) slightly clockwise. If less than 3 bars are present, adjust B3 slightly counter clockwise. Check horizontal hold control action. Picture should pull into sync with 60 degrees from full clockwise rotation of the horizontal hold control.

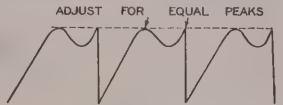


FIG. 6

PHOTOFACT* Folder

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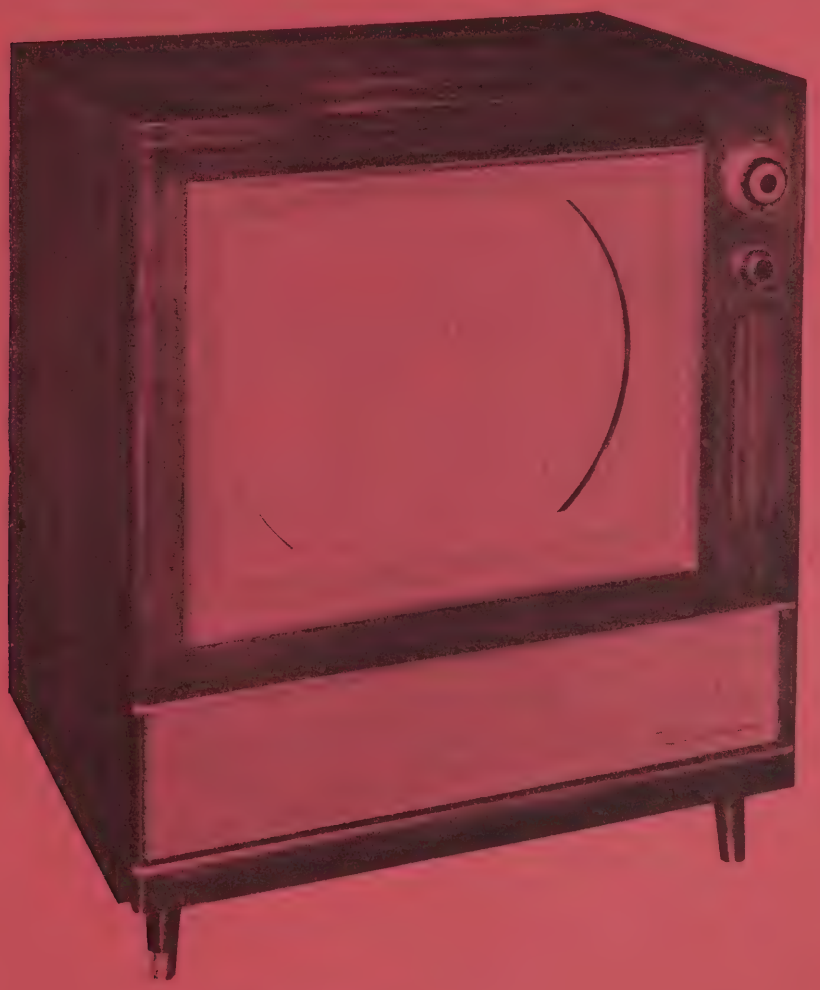

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DATE 7-56 SET 323 FOLDER 8

PHOTOFACT* Folder
*TRADE MARK
RETMA MEMBER

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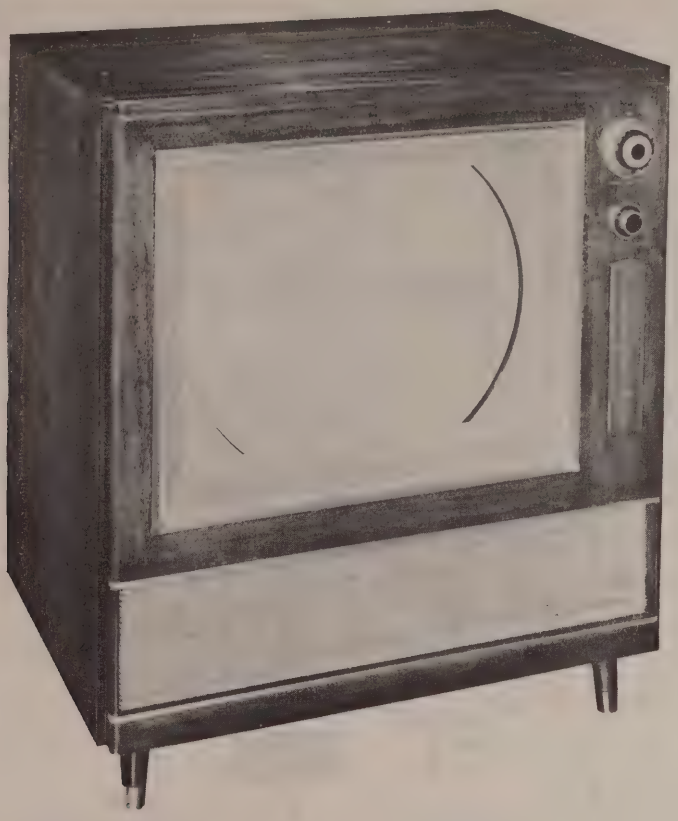

MAGNAVOX
CHASSIS CMUD477AA

TRADE NAME	Magnavox Chassis CMUD477AA and Amplifier Chassis AMP-145AA
MANUFACTURER	Magnavox Co., 2131 Bueter Road, Fort Wayne 4, Indiana
TYPE SET	Color Television Receiver
TUBES	Thirty
POWER SUPPLY	110-120 Volts AC-60 Cycle — RATING 3.6 Amp. @ 117 Volts AC
TUNING RANGE	Channels 2 thru 13 VHF, 14 thru 83 UHF, Video IF 45.75MC, Sound IF 41.25MC (Intercarrier)

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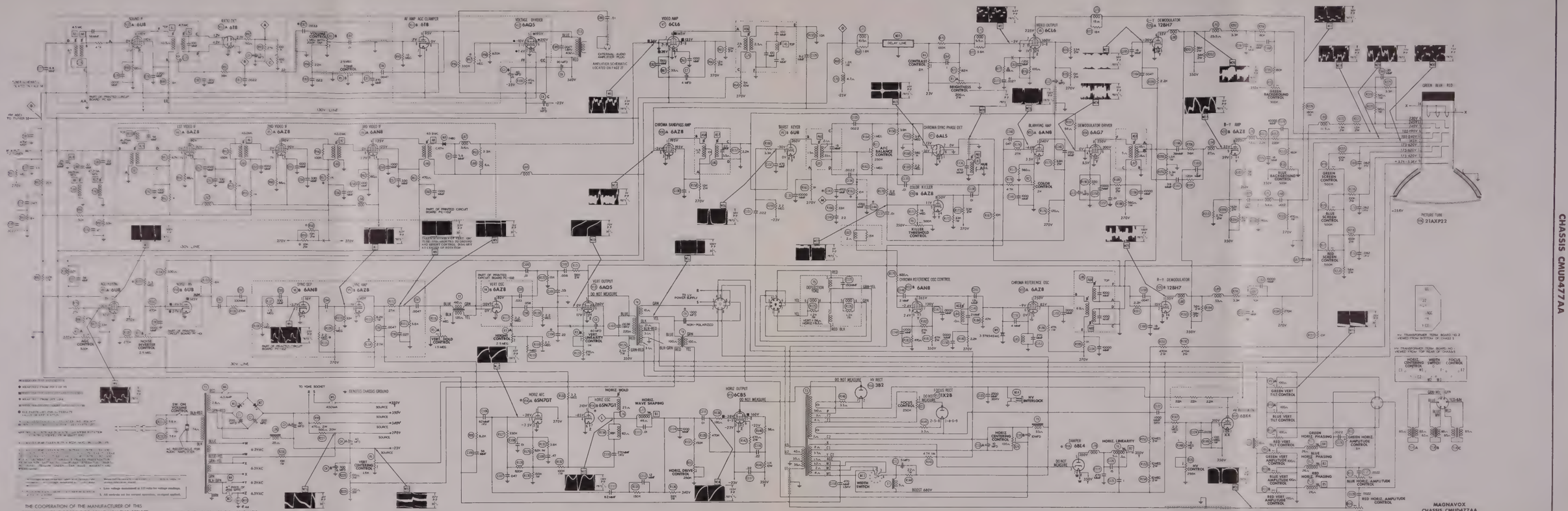
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THE COOPERATION OF THE MANUFACTURER OF THIS RECEIVER MAKES IT POSSIBLE TO BRING YOU THIS SERVICE
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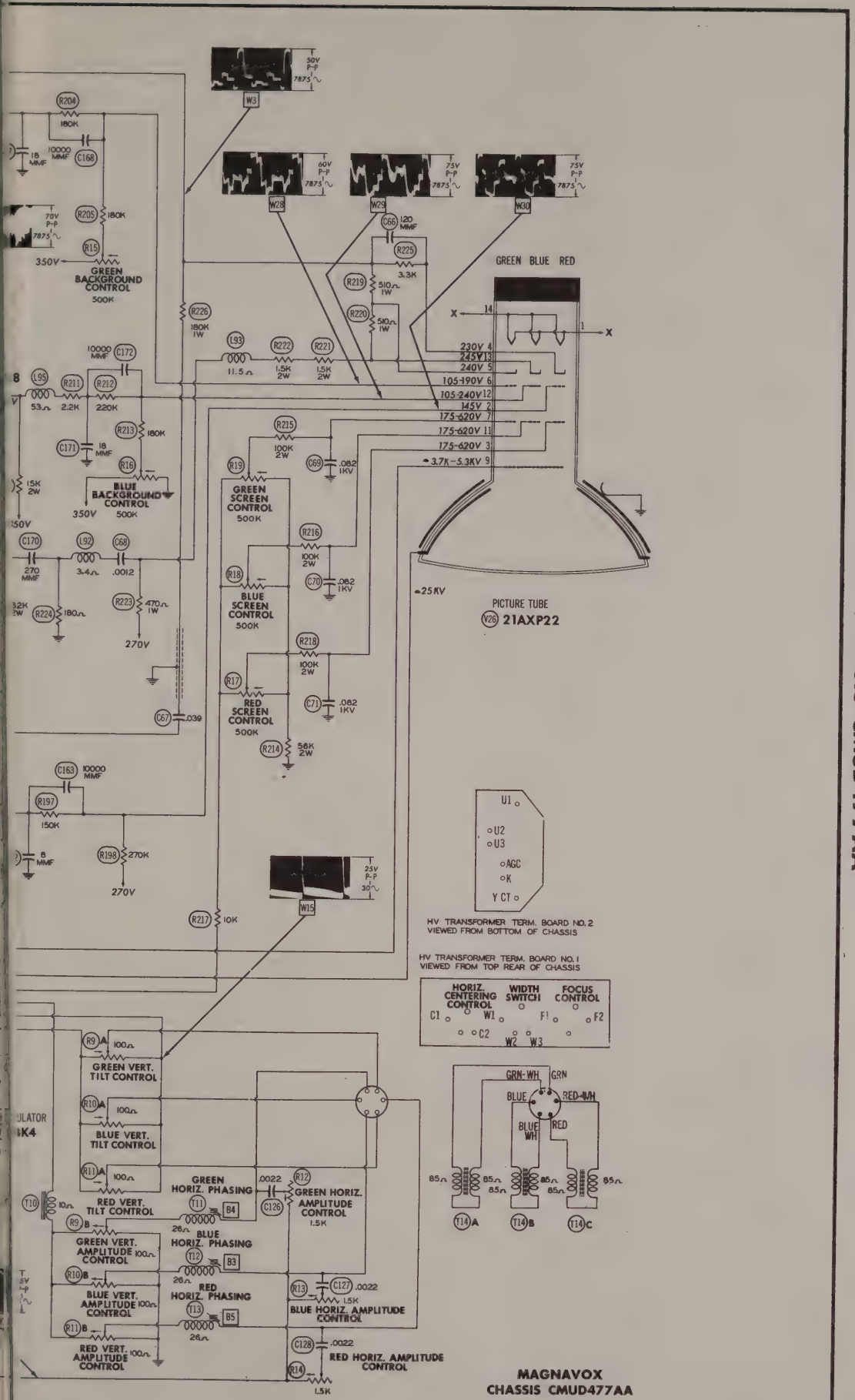

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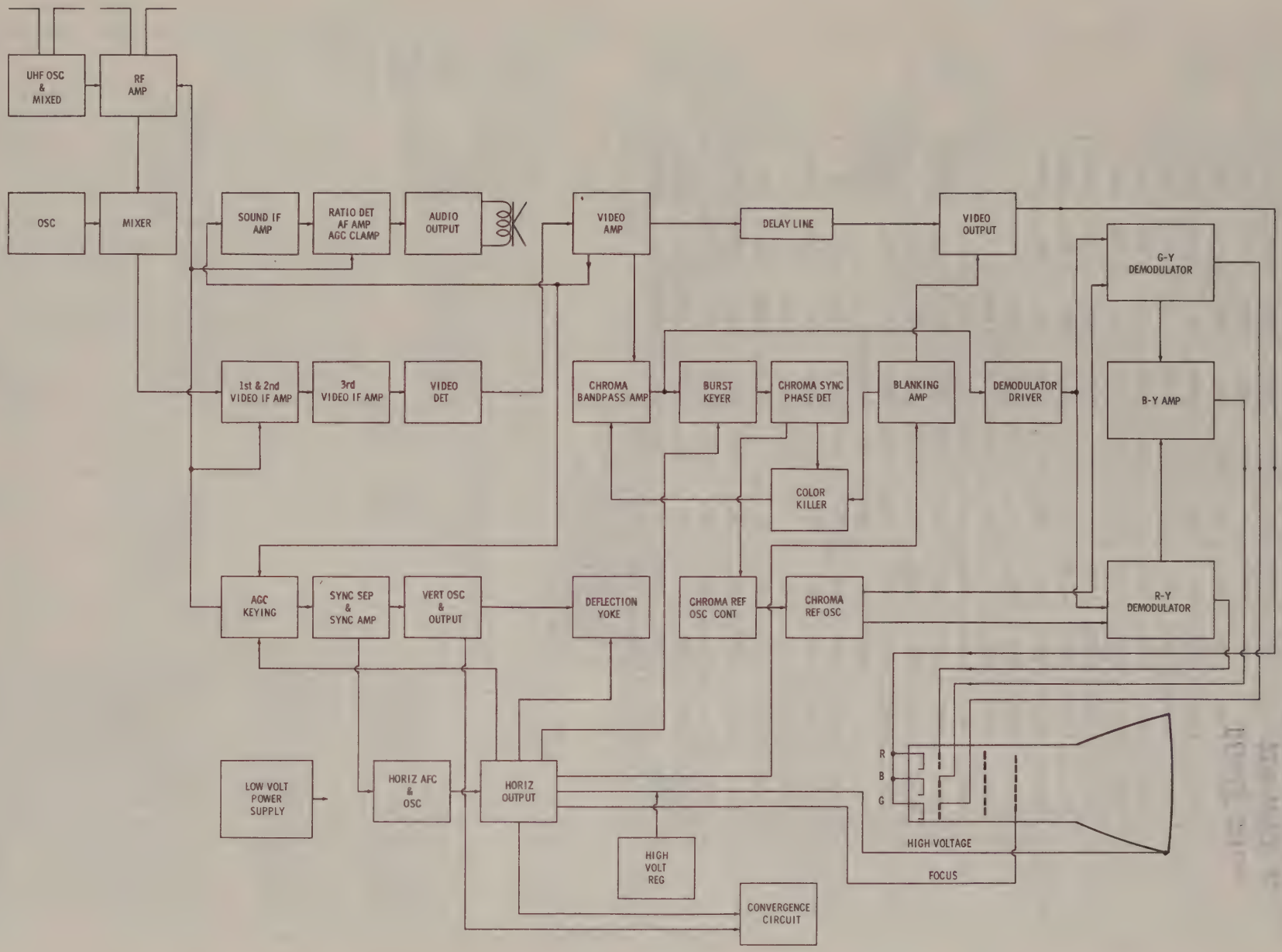

BLOCK DIAGRAM

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SET 323 FOLDER 8

RESISTANCE MEASUREMENTS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V 1	6AF4A	*† 20KΩ	8KΩ	0Ω	.1Ω	0Ω	8KΩ	*† 20KΩ		
V 2	6BQ7A	† 2.5KΩ	500KΩ	600KΩ	0Ω	.1Ω	600KΩ	250KΩ	120Ω	0Ω
V 3	6X8	0Ω	100KΩ	† 14KΩ	.1Ω	0Ω	0Ω	100KΩ	† 19KΩ	† 19KΩ
V 4	6AZ8	† 7KΩ	† 7KΩ	68Ω	.1Ω	0Ω	35KΩ	120Ω	▲ 4Meg	1.6Meg
V 5	6AZ8	† 7KΩ	† 7KΩ	68Ω	.1Ω	0Ω	35KΩ	0Ω	■ 11KΩ	33KΩ
V 6	6AN8	■ 2.2Meg	3Meg	0Ω	.1Ω	0Ω	■ 470Ω	■ 470Ω	.2Ω	180Ω
V 7	6CL6	900Ω	4.2KΩ	† 12KΩ	.1Ω	0Ω	† 5.5KΩ	0Ω	† 12KΩ	4.2KΩ
V 8	6CL6	100Ω	50KΩ	† 15KΩ	.1Ω	0Ω	† 5KΩ	0Ω	† 15KΩ	50KΩ
V 9	6U8	† 1.5KΩ	■ 25KΩ	† 500Ω	.1Ω	0Ω	250KΩ	25KΩ	3.5Ω	2.2Meg
V 10	6U8	† 24KΩ	47KΩ	■ 1.8KΩ	.1Ω	0Ω	■ 1.8KΩ	120Ω	1.2KΩ	1.8Meg
V 11	6T8	INF	27KΩ	INF	.1Ω	0Ω	250KΩ	0Ω	10Meg	† 330KΩ
V 12	6AQ5	600KΩ	25KΩ	0Ω	.1Ω	† 900Ω	† 470Ω	600KΩ		
V 13	6AQ5	2.2Meg	500Ω	0Ω	.1Ω	† 2.7KΩ	† 2.5KΩ	2.2Meg		
V 14	6SN7GT	1.3Meg	† 500Ω	230KΩ	250KΩ	† 39KΩ	0Ω	.1Ω	0Ω	
V 15	6CB5	† 11KΩ	.1Ω	200Ω	470KΩ	470KΩ	200Ω	0Ω	† 11KΩ	TOP CAP ▲ 60Ω
V 16	6BL4	† 3.5Ω	NC	200KΩ	NC	† 3.5Ω	NC	† 2Ω	† 2Ω	
V 17	1X2B	30Meg	30Meg	NC	30Meg	30Meg	30Meg	TP	30Meg	TOP CAP ▲ 80KΩ
V 18	3B2		PINS	1-8	HAVE	INF	RESISTANCE			TOP CAP ▲ 570Ω
V 19	6BK4	8KΩ	† 11KΩ	8KΩ	8KΩ	1.2Meg	NC	† 11KΩ	8KΩ	TOP CAP INF
V 20	6AZ8	† 11KΩ	† 11KΩ	0Ω	.1Ω	0Ω	560KΩ	0Ω	† 20KΩ	3.5Meg
V 21	6AL5	.2Ω	.2Ω	.1Ω	0Ω	2.5Meg	0Ω	1.8Meg		
V 22	6AN8	† 5KΩ	27KΩ	560Ω	0Ω	.1Ω	† 2.7KΩ	† 20KΩ	2Meg	470Ω
V 23	6AZ8	† 1.5KΩ	† 47KΩ	.4Ω	.1Ω	0Ω	47KΩ	2.7KΩ	† 15KΩ	† 60KΩ
V 24	6AG7	0Ω	0Ω	0Ω	60Ω	220Ω	† 11KΩ	.1Ω	† 1.1KΩ	
V 25	12BH7	† 28KΩ	2.2KΩ	0Ω	.1Ω	.1Ω	† 28KΩ	2.2KΩ	0Ω	0Ω
V 26	21AXP22	† 11KΩ	† 110KΩ	▲130-270KΩ	† 9KΩ	† 5KΩ	† 110-170KΩ	▲130-270KΩ	NC	30Meg
		PIN 10 NC	PIN 11 ▲130-270KΩ	PIN 12 † 130KΩ	PIN 13 † 4KΩ	PIN 14 † 11KΩ				

* MEASURED IN "UHF" POSITION.
† MEASURED FROM POSITIVE SIDE OF C1.
■ MEASURED FROM 130V LINE.
▲ MEASURED FROM PIN 3 OF V16.
NC-NO CONNECTION.
TP-TIE POINT.

ALIGNMENT INSTRUCTIONS

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

The high voltage should be disabled by removing the fuse (M3) in series with pin 3 of the deflection yoke socket. Connect a 1500 ohm/100 watt resistor from pin 7 of deflection yoke socket (B+ line) to high side of vertical centering control (R8A) (B- line).

SOUND IF ALIGNMENT USING AM SIGNAL GENERATOR AND VTVM

Ground pin 8 (grid) of 3rd Video IF Amp. Tube (V6A) to chassis.
Connect two matched 100KΩ (±1%) resistors in series from point Ⓐ to chassis. The junction of these two resistors is alignment point Ⓒ as shown on the schematic.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	CHANNEL	CONNECT VTVM	ADJUST	REMARKS
1.	.01MFD	High side to pin 2 (grid) of first video amplifier tube (V7). Low side to chassis.	4.5MC (Unmod)	Any	DC probe to point Ⓐ. Common to chassis.	A1	Adjust for maximum deflection. Attenuate generator output for -15 volts on VTVM for final peaking A1, A3 and A4.
2.	"	"	"	"	DC probe to point Ⓑ. Common to point Ⓒ.	A2	Adjust for zero reading. A positive and negative reading will be obtained on either side of the correct setting. Move VTVM to point Ⓐ and chassis as in step 1. Retouch A4 for maximum deflection and then repeat step 2.
3.	"	"	"	"	DC probe to point Ⓐ. Common to chassis.	A3, A4	Adjust for maximum deflection. Remove ground from pin 8 of V6A. Remove 2 - 100KΩ resistors from point Ⓐ and chassis.

SOUND IF ALIGNMENT USING FM SIGNAL GENERATOR AND OSCILLOSCOPE

Use frequency modulated signal with 60% modulation and 450KC sweep. Use 120% sawtooth voltage in scope for horizontal deflection.
Ground pin 8 (grid) of 3rd Video IF Amp. Tube (V6A).

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
1.	.01MFD	High side to pin 2 (grid) of first video amplifier (V7). Low side to chassis.	4.5MC (450KC Swp)	4.5MC	Any	Vert. Amp. to point Ⓐ. Low side to chassis.	A1, A3, A4	Disconnect stabilizing capacitor (C5). Adjust for curve of maximum amplitude and symmetry similar to Fig. 1.
2.	"	"	"	"	"	Vert. Amp. to point Ⓑ. Low side to chassis.	A2	Reconnect stabilizing capacitor (C5). Adjust so that 4.5MC occurs at center of crossover lines as in Fig. 2. SLIGHTLY retouch A1 for maximum amplitude and straightness of crossover lines. Remove ground from pin 8 of V6A. Continue alignment with step 4.

VIDEO TRAP ALIGNMENT

Connect the negative lead of a 7 volt bias supply to point Ⓓ. Connect the positive lead to chassis.
Ground pin 8 (grid) of 3rd Video IF Amp. Tube (V6A) to chassis.
Connect the synchronized sweep voltage from the sweep generator to the horizontal input of the oscilloscope for horizontal deflection.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
4.	.01MFD	High side to pin 2 (grid) of first video amplifier tube (V7). Low side to chassis.	Not used	4.5MC (400%Mod)	Any	Vert. Amp. thru detector (Detector lead) of Fig.3) to pin 1 (plate) of band-pass amplifier tube (V20A). Low side to chassis.	A5	Use high signal generator output. Adjust for MINIMUM 400% indication on scope. Remove ground from pin 8 of V6A.

VIDEO IF ALIGNMENT

Connect the negative lead of a variable bias supply to the ungrounded side of C76. Positive lead to chassis. Adjust for -6 volts at ungrounded side of C76. Connect a second bias supply (steps 13 and 14), negative lead to point Ⓖ. Positive lead to tuner chassis. Adjust for -3 volts bias at point Ⓖ.
Connect the synchronized sweep voltage from the sweep generator to the horizontal input of the oscilloscope for horizontal deflection.
The sweep generator output lead should be terminated with its characteristic impedance, usually 50 ohms.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
5.	.0015MFD Ceramic Capacitor	High side to point Ⓔ. Low side to chassis.	Not used	45.0MC	Any non-interfering channel	USE VTVM. DC probe to point Ⓓ. Common to chassis.	A6	Adjust for maximum deflection. Attenuate signal generator output to maintain not more than -8 volts on VTVM. Maintain -6 volts bias at ungrounded side of C76.
6.	"	"	"	42.0MC	"	"	A7	"
7.	"	"	"	43.9MC	"	"	A8	"
8.	"	"	"	39.75MC	"	"	A9	Adjust for MINIMUM deflection. Increase signal generator output to produce 3 volts on VTVM at final MINIMUM adjustments.
9.	"	"	"	41.25MC	"	"	A10, A11	"
10.	"	"	"	47.25MC	"	"	A12	"
11.	"	High side to point Ⓔ. Low side to tuner chassis. (Use very short shielded leads).	44MC (10MC Swp)	42.17MC 42.75MC 45.75MC	4	Vert. Amp. thru detector (detector lead of Fig.3) to pin 1 (plate) of first video IF amp. tube (V4A). Low side to chassis.	A13, A14, A15	Connect the load leads of IF test block (Fig.3) to pin 1 (plate) of V5A (6AZ8) and pin 6 (plate) V6A (6AN8). If a separate signal generator is used for markers couple it loosely to pin 6 (grid) of first video IF amplifier tube (V4A). Preset A13 trimmer to MINIMUM capacity. Adjust A14 and A15 for maximum gain with 45.75MC marker at 70% of maximum response as in Fig. 4. Adjust A13 to place 42.17MC marker a 50% of maximum response with 42.75MC marker on low frequency side of peak as in Fig. 4. If necessary, SLIGHTLY retouch A14 and A15. Remove IF test block.
12.	"	"	"	42.17MC 42.75MC 45.0MC 45.75MC	"	Vert. Amp. to point Ⓓ. Low side to chassis.	A6, A7, A8	Adjust sweep generator for 8 volts peak to peak on scope. If a separate signal generator is used for marker couple it loosely to pin 6 (grid) of first video IF amplifier tube (V4A). Check for response curve similar to Fig. 5. If necessary, retouch A6, A7 and A8 for desired response. Exercise care to obtain response curve as in Fig. 5.

VIDEO IF ALIGNMENT (Cont).

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
13.	1000Ω Carbon Resistor in series with .0015MFD ceramic capacitor	High side to front terminal of 1N82 crystal h holder. Low side to chassis. (Use very short leads).	650MC (10MC Swp)	42.17MC 42.75MC 45.0MC 45.75MC	Between channels 43 and 44	Vert. Amp. thru detector (detector lead of Fig.3) to junction of 180Ω resistor and .0015 MFD. (See remarks) Low side to chassis.	A16, A17, A18	Set tuner to UHF position. Connect a 180Ω resistor in series with a .0015MFD ceramic capacitor between point (F) and chassis. Capacitor end connect to point (F). Connect a second bias supply to point (G). Positive lead to chassis. Adjust for -3 volts bias at point (G). Couple marker generator loosely to detector (Fig.3). Attenuate sweep generator for .5 volts peak to peak on scope. Adjust A16 for maximum gain with 45.75MC and 42.5MC markers as in Fig. 6. Adjust A17 to place 45.75MC marker at peak of curve. Adjust A18 for MINIMUM tilt of curve. (Fig.6). If necessary, to obtain proper bandwidth, adjust L55 (IF trap coil). L55 is adjusted by expanding or compressing coil turns. Remove 180Ω resistor and .0015 MFD capacitor from point (F) and chassis.
14.	Two 130Ω Carbon Resistors	Across antenna (VHF) terminals with 130Ω in each lead.	44MC (10MC Swp)	"	Check all VHF channels	Vert. Amp. to point (D). Low side to chassis.	A6, A7, A8	Couple marker generator loosely to first video IF amplifier grid. Check for response curve similar to Fig. 5 on all VHF channels. SLIGHTLY retouch A6, A7 and A8 if necessary to correct for any overall tilt as in step 12.
15.	Remove VHF sweep generator and connect UHF sweep generator to antenna terminals. Check all UHF channels for response similar to Fig. 5. SLIGHTLY retouch A16, A17 and A18 to correct any overall tilt. Disconnect generator and bias supplies.							

ANTENNA MATCHING UNIT ALIGNMENT

The antenna unit has been properly aligned at the factory. The RF unit is aligned with a particular antenna matching unit in place. If a new antenna unit is installed, the RF unit should be realigned.
The FM trap (A55) may be aligned without adversely affecting the unit.
Disconnect the lead from L15 (point (H)) to the channel selector switch. Use a short jumper to connect output of matching unit at point H through a .001MFD capacitor to pin 6 (grid) of second video IF amplifier tube (V5A). Remove the first video IF amplifier tube (V4) from its socket. The matching unit cover must be in place during alignment.
Connect the negative lead of a variable bias supply to the ungrounded side of C76. Positive lead to chassis. Adjust for -6 volts at ungrounded side of C76.
Adjustment A19 thru A22 are adjusted by expanding or compressing coil turns.
Connect the synchronized sweep voltage from the sweep generator to the horizontal input of the oscilloscope for horizontal deflection.
The sweep generator output lead should be terminated with its characteristic impedance, usually 50 ohms.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
16.	Direct	Across antenna terminals. Low side to chassis.	Not used	45.75MC (400% Mod)	Any	Vert. Amp. to point (C). Low side to chassis.	A19	Adjust for MINIMUM 400% indication on scope.
17.	"	"	"	41.25MC	"	"	A20	"
18.	Two 130Ω Carbon Resistors	Across antenna terminals with 130Ω in each lead.	52MC (10MC Swp)	50MC 52MC 53MC 60MC	"	Vert. Amp. thru detector (detector lead of Fig.3) to point (H). Low side to chassis.	A21, A22	Remove .001MFD capacitor from point (H). to grid of V5A. Connect a 300Ω, ½ watt carbon resistor from point (H) to chassis. Use very short lead. Set sweep generator for maximum output. Adjust A21 and A22 for response curve similar to Fig. 7. Repeat steps 16, 17 and 18 until no further improvement is noted. A21 affects shoulder of curve (52MC point). Adjust A22 for maximum response at 53MC point. If distortion of response is affected by a second harmonic of sweep generator output, tune a (FM trap) for maximum inductance while adjusting A19 thru A22. After final adjustments return A55 to its original position. Restore connection from L15 to channel switch. Replace V4 in its socket.

VHF TUNER ALIGNMENT

A tuner unit which is operative and requires only minor touch-up adjustments will require no presetting of adjustments. When complete alignment is necessary make the following adjustments:
Preset A23 all the way out. Set channels 7 to 13 oscillator slugs one turn from tight.
Disconnect the link from terminals of L58 (converter plate transformer) and shunt the terminals with a 39 ohm carbon resistor.
Connect a 56 ohm carbon resistor from point (H) to chassis.
Tuner alignment as outlined below requires the use of a heterodyne frequency meter.
Short tuner AGC to chassis and point (G).
Connect the synchronized sweep voltage from the sweep generator to the horizontal input of the oscilloscope for horizontal deflection.
The sweep generator output lead should be terminated with its characteristic impedance, usually 50 ohms.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
19.		RF input heterodyne frequency meter to end of insulated wire in hole provided for adjustment of A26. Exercise care that the wire does not touch any tuned circuit causing oscillator drift.	Not used	Set freq. meter to 227MC	8	Not used	A24, A25, A26	Preset A24 to read -3.5 volts at point (I). The limits of oscillator injection voltage are 2.5 volts minimum and 5.5 volts maximum. Set fine tuning control maximum clockwise. Adjust A25 for audible beat on frequency meter. Adjust A23 clockwise until beat note just begins to change, then turn one full turn in same clockwise direction. Return fine tuning control to its mechanical center of its range.
20.	NOTE: If channel 8 oscillator frequency cannot be reached by adjustment of A25, switch to channel 13 and adjust A27 for channel 13 oscillator frequency. Switch back to channel 8 and adjust A23 for channel 8 oscillator frequency. Switch to channel 13 and readjust A27 for channel 13 oscillator frequency. Repeat until proper frequencies are obtained and no changes are noted.							
21.	Two 130Ω Carbon Resistors	Across antenna terminals with 130Ω in each lead.	183MC (10MC Swp)	181.25MC 185.75MC	8	Vert. Amp. to point (I). Low side to chassis.	A26, A39, A40	Couple signal generator loosely to antenna terminals to provide markers. Adjust scope gain for maximum and attenuate generator output for minimum signal input. That will produce usable pattern on scope. Adjust for response similar to Fig. 8. A39 affects frequency of bandpass, A40 affects tilt. Adjust A26 to place markers at 100% on response curve. A26 also affects bandwidth.
22.	Connect the DC probe of VTVM to point (I). Common to chassis. Adjust A24 for -3.5 volts at point (I). Repeat steps 19, 20 and 21 until proper response is obtained.							
23.	Two 300Ω Carbon Resistors	Across antenna terminals with 300Ω in each lead.	213MC (10MC swp)	211.25MC 215.75MC	13	Vert. Amp. to point (I). Low side to chassis.	A41, A42	Adjust for response curve similar to Fig.8. Turn off generator and check oscillator injection at point (I) using VTVM as in step 22. If necessary to adjust A24, turn sweep generator and signal generator back on and recheck channel 13 response. If necessary retouch A41 and A42 for desired response.

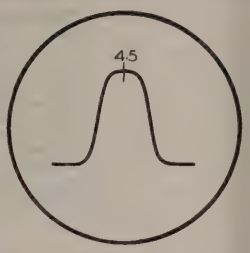

FIG. 1

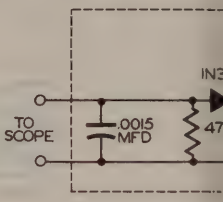

FIG. 3

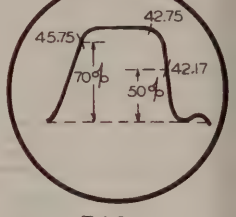

FIG. 4

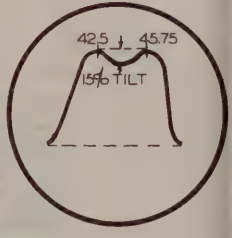

FIG. 6

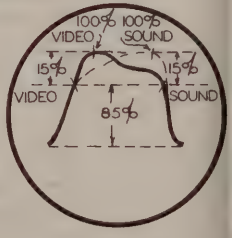

FIG. 8

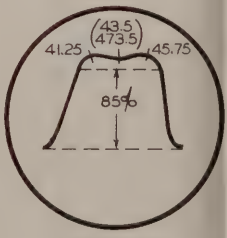

FIG. 10

ALIGNMENT INSTRUCTIONS (cont)

VIDEO IF ALIGNMENT (Cont).

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
13.	1000Ω Carbon Resistor in series with .0015MFD ceramic capacitor	High side to front terminal of 1N82 crystal holder. Low side to chassis. (Use very short leads).	650MC (30MC Swp)	42.17MC 42.75MC 45.0MC 45.75MC	Between channels 43 and 44	Vert. Amp. thru detector (detector lead of Fig.3) to junction of 180Ω resistor and .0015 MFD. (See remarks) Low side to chassis.	A16, A17, A18	Set tuner to UHF position. Connect a 180Ω resistor in series with a .0015MFD ceramic capacitor between point ⑦ and chassis. Capacitor end connect to point ⑦. Connect a second bias supply to point ⑩. Positive lead to chassis. Adjust for -3 volts bias at point ⑩. Couple marker generator loosely to detector (Fig. 3). Attenuate sweep generator for .5 volts peak to peak on scope. Adjust A16 for maximum gain with 45.75MC and 42.5MC markers as in Fig. 6. Adjust A17 to place 45.75MC marker at peak of curve. Adjust A18 for MINIMUM tilt of curve. (Fig.6). If necessary, to obtain proper bandwidth, adjust L55 (IF trap coil). L55 is adjusted by expanding or compressing coil turns. Remove 180Ω resistor and .0015 MFD capacitor from point ⑦ and chassis.
14.	Two 130Ω Carbon Resistors	Across antenna (VHF) terminals with 130Ω in each lead.	44MC (30MC Swp)	"	Check all VHF channels	Vert. Amp. to point ⑦. Low side to chassis.	A6, A7, A8	Couple marker generator loosely to first video IF amplifier grid. Check for response curve similar to Fig. 5 on all VHF channels. SLIGHTLY retouch A6, A7 and A8 if necessary to correct for any overall tilt as in step 13.
15.	Remove VHF sweep generator and connect UHF sweep generator to antenna terminals. Check all UHF channels for response similar to Fig. 5. SLIGHTLY retouch A16, A17 and A18 to correct any overall tilt. Disconnect generator and bias supplies.							

ANTENNA MATCHING UNIT ALIGNMENT

The antenna unit has been properly aligned at the factory. The RF unit is aligned with a particular antenna matching unit in place. If a new antenna unit is installed, the RF unit should be realigned.
The FM trap (A55) may be aligned without adversely affecting the unit.
Disconnect the lead from L55 (point ⑨) to the channel selector switch. Use a short jumper to connect output of matching unit at point ⑨ through a .001MFD capacitor to pin 6 (grid) of second video IF amplifier tube (V5A). Remove the first video IF amplifier tube (V4) from its socket. The matching unit cover must be in place during alignment.
Connect the negative lead of a variable bias supply to the ungrounded side of C76. Positive lead to chassis Adjust for -6 volts at ungrounded side of C76.
Adjustment A19 thru A22 are adjusted by expanding or compressing coil turns.
Connect the synchronized sweep voltage from the sweep generator to the horizontal input of the oscilloscope for horizontal deflection.
The sweep generator output lead should be terminated with its characteristic impedance, usually 50 ohms.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
16.	Direct	Across antenna terminals. Low side to chassis.	Not used	45.75MC (400^Mod)	Any	Vert. Amp. to point ⑨. Low side to chassis.	A19	Adjust for MINIMUM 400^ indication on scope.
17.	"	"	"	41.25MC	"	"	A20	"
18.	Two 130Ω Carbon Resistors	Across antenna terminals with 130Ω in each lead.	53MC (30MC Swp)	50MC 53^C 53MC 60MC	"	Vert. Amp. thru detector (detector lead of Fig.3) to point ⑨. Low side to chassis.	A21, A22	Remove .001MFD capacitor from point ⑨ to grid of V5A. Connect a 300Ω, 2 watt carbon resistor from point ⑨ to chassis. Use very short lead. Set sweep generator for maximum output. Adjust A21 and A22 for response curve similar to Fig. 7. Repeat steps 16, 17 and 18 until no further improvement is noted. A21 affects shoulder of curve (53MC point). Adjust A22 for maximum response at 53MC point. If distortion of response is affected by a second harmonic of sweep generator output, tune a (FM trap) for maximum inductance while adjusting A19 thru A22. After final adjustments return A55 to its original position. Restore connection from L15 to channel switch. Replace V4 in its socket.

VHF TUNER ALIGNMENT

A tuner unit which is operative and requires only minor touch-up adjustments will require no presetting of adjustments. When complete alignment is necessary make the following adjustments:
Preset A23 all the way out. Set channels 7 to 13 oscillator slugs one turn from tight.
Disconnect the link from terminals of L58 (converter plate transformer) and shunt the terminals with a 39 ohm carbon resistor.
Connect a 56 ohm carbon resistor from point ⑫ to chassis.
Tuner alignment as outlined below requires the use of a heterodyne frequency meter.
Short tuner AGC to chassis and point ⑭
Connect the synchronized sweep voltage from the sweep generator to the horizontal input of the oscilloscope for horizontal deflection.
The sweep generator output lead should be terminated with its characteristic impedance, usually 50 ohms

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
19.		RF input heterodyne frequency meter to end of insulated wire in hole provided for adjustment of A26. Exercise care that the wire does not touch any tuned circuit causing oscillator drift.	Not used	Set freq. meter to 227MC	8	Not used	A24, A25, A26	Preset A24 to read -3.5 volts at point ⑦. The limits of oscillator injection voltage are 2.5 volts minimum and 5.5 volts maximum. Set fine tuning control maximum clockwise. Adjust A25 for audible beat on frequency meter. Adjust A23 clockwise until beat note just begins to change, then turn one full turn in same clockwise direction. Return fine tuning control to its mechanical center of its range.
20.	NOTE: If channel 8 oscillator frequency cannot be reached by adjustment of A26, switch to channel 13 and adjust A27 for channel 13 oscillator frequency. Switch back to channel 8 and adjust A23 for channel 8 oscillator frequency. Switch to channel 13 and readjust A27 for channel 13 oscillator frequency. Repeat until proper frequencies are obtained and no changes are noted.							
21.	Two 130Ω Carbon Resistors	Across antenna terminals with 130Ω in each lead.	183MC (30MC Swp)	181.25MC 185.75MC	8	Vert. Amp. to point ⑦. Low side to chassis.	A26, A39, A40	Couple signal generator loosely to antenna terminals to provide markers. Adjust scope gain for maximum and attenuate generator output for minimum signal input. That will produce usable pattern on scope. Adjust for response similar to Fig. 8. A39 affects frequency of bandpass, A40 affects tilt. Adjust A26 to place markers at 100% on response curve. A26 also affects bandwidth.
22.	Connect the DC probe of VTVM to point ⑦. Common to chassis. Adjust A34 for -3.5 volts at point ⑦. Repeat steps 19, 20 and 21 until proper response is obtained.							
23.	Two 300Ω Carbon Resistors	Across antenna terminals with 300Ω in each lead.	215MC (30MC swp)	211.25MC 215.75MC	13	Vert. Amp. to point ⑦. Low side to chassis.	A41, A43	Adjust for response curve similar to Fig. 8. Turn off generator and check oscillator injection at point ⑦ using VTVM as in step 22. If necessary to adjust A34, turn sweep generator and signal generator back on and recheck channel 13 response. If necessary retouch A41 and A43 for desired response.

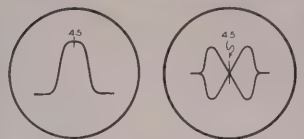

FIG. 1 FIG. 2

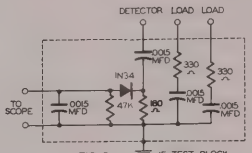

FIG. 3

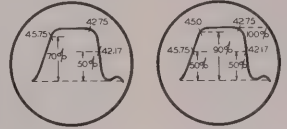

FIG. 4 FIG. 5

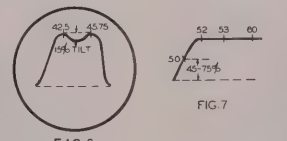

FIG. 6 FIG. 7

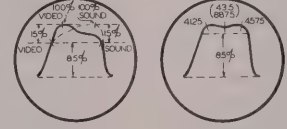

FIG. 8 FIG. 9

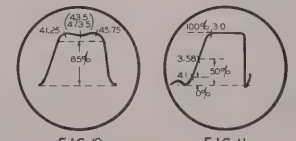

FIG. 10 FIG. 11

FIG. 12 FIG. 13 FIG. 14

VHF TUNER ALIGNMENT (Cont).

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
24.	Two 300Ω carbon resistors	Across antenna terminals with 300Ω in each lead.	183MC (30MC Swp)	181.25MC 185.75MC	8	Vert. Amp. to point ⑦. Low side to chassis.	A26, A39 A40	If necessary retouch A26, A39 and A40 to obtain desired response (Fig. 8). If A40 required adjustment turn off generators and switch back to channel 13 and check injection voltage A5 in step 22. Repeat steps 23 and 24 until proper response is obtained.
25.	"	"	213MC (30MC Swp)	211.25MC 215.75MC	13	"		Check for response curve similar to Fig. 8. Check oscillator injection voltage for each channel at point ⑦. If markers fall below 85% of maximum on any one channel retouch A38 and A39 thru A43 to obtain response curves within proper limits as in Fig. 8.
			207MC (30MC Swp)	205.75MC 209.75MC	12			
			201MC (30MC Swp)	199.75MC 203.75MC	11			
			195MC (30MC Swp)	193.25MC 197.75MC	10			
			189MC (30MC Swp)	187.25MC 191.75MC	9			
			183MC (30MC Swp)	181.75MC 185.75MC	8			
			177MC (30MC Swp)	175.25MC 179.75MC	7			
26.		Connect frequency meter as in step 19.	Not used	Freq. meter to 129MC	6	Not used	A34	Set fine tuning control to its mid-range position. Adjust A34 for an audible beat on frequency meter.
27.	Two 130Ω Carbon Resistors	Across antenna terminals with 130Ω in each lead.	85MC (30MC Swp)	83.25MC 87.75MC	"	Vert. Amp. to point ⑦. Low side to chassis.	A43, A44	Adjust for response curve similar to Fig. 8. Check oscillator injection voltage as in step 22. Readjust A34 if necessary.
28.	If A34 required readjustment switch receiver and generator to channel 8. Readjust A40 for response similar to Fig. 8. Recheck A23 and A25 for proper oscillator frequency as in step 19.							
29.	Two 130Ω Carbon Resistors	Across antenna terminals with 130Ω in each lead.	93MC (30MC Swp)	93.25MC 97.75MC	6	Vert. Amp. to point ⑦. Low side to chassis.		Check for response curve similar to Fig. 8. Check oscillator injection voltage on each channel at point ⑦. If markers fall below 85% on any one channel SLIGHTLY retouch A43 and A44. If unable to obtain correct MINIMUM tilt on channels 5 thru 2 knife coils (by expanding or compressing coil turns) L39 thru L43 and L47 thru L50.
			99MC (30MC Swp)	97.75MC 101.75MC	5			
			105MC (30MC Swp)	101.75MC 105.75MC	4			
			63MC (30MC Swp)	61.25MC 65.75MC	3			
			57MC (30MC Swp)	55.25MC 59.75MC	2			
30.		Connect frequency meter as in step 19.	Not used	Freq. meter to 227MC	13	Not used	A37	Adjust individual channel oscillator slug for audible beat on each channel. Recheck oscillator injection voltage on each channel at point ⑦ to verify that the voltage is within (2 volts MINIMUM and 5.5 volts maximum) limits.
				261MC	12		A38	
				245MC	11		A39	
				229MC	10		A40	
				233MC	9		A41	
				217MC	8		A42	
				221MC	7		A43	
				129MC	6		A44	
				113MC	5		A45	
				107MC	4		A46	
				101MC	3		A47	
				61MC	2		A48	
31.	Two 130Ω Carbon Resistors	Across antenna terminals with 130Ω in each lead.	Not used	213MC (400^Mod.)	13	Vert. Amp. to point ⑦. Low side to chassis.	A45	Connect the negative lead of a variable bias supply to ungrounded side of C76. Positive lead to chassis. Adjust for -6 volts at ungrounded side of C76. Remove short from tuner AGC at point ⑭. Connect negative lead of a second bias supply to point ⑭. Positive lead to chassis. Adjust for -15 volts at point ⑭. Set scope for maximum gain. Adjust for MINIMUM 400^ indication on scope.
32.	"	"	"	85MC (400^Mod)	6	"	A48	"
33.	Two 130Ω Carbon Resistors	Across antenna terminals with 130Ω in each lead.	183MC (30MC Swp)	181.25MC 185.75MC	8	Vert. Amp. to point ⑦. Low side to chassis.	A47	Reduce bias to -3 volts at point ⑦. Adjust A47 for maximum amplitude between two peaks on response curve.
34.	"	"	213MC (30MC Swp)	211.25MC 215.75MC	13	"	A48	Adjust A48 for maximum amplitude between two peaks on response curve. A48 is adjusted by expanding or compressing coil turns. Repeat steps 33 and 34. Increase bias at point ⑭ to -15 volts. Repeat steps 31 and 33. Then reduce bias at point ⑭ to -3 volts and again repeat steps 33 and 34.
35.	"	"	85MC (30MC Swp)	83.25MC 87.75MC	6	"	A49	Adjust A49 for maximum amplitude between two peaks on response curve.
36.	Switch tuner thru all VHF channels and observe the response on scope, as in steps 35 and 29. The dip at mid-point between two peaks on response curve should be 85% of maximum. If dip exceeds this limit it will be necessary to knife coils L33 thru L36 and L47 thru L50 to correct dip. Always knife coils starting with the highest frequency (channel 13 thru 2) and continuing to the lowest. Remove all test equipment and bias supplies.							

MAGNAVOX
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ALIGNMENT INSTRUCTIONS (cont)

UHF TUNER ALIGNMENT

Turn the change over switch to UHF position. To make the RF adjustment of the UHF tuner, the UHF tuner unit will have to be removed from the set. IF and oscillator adjustments may be aligned without removing UHF tuner. Connect a 100Ω carbon resistor from the center conductor of IF cable to chassis (point ⟨J⟩ on schematic). If the oscilloscope does not have a sensitivity of 5 millivolts per inch, a suitable preamplifier may be used.

Fabricate a test dial with markers scribed on its circumference at 0, 5 and 164 degrees. The test dial should be made to fit over the split gear on the tuner shaft for accurate alignment. Locate the "0" degree reference point with the capacitor plates fully meshed. The stop pin on the tuner should be against the stop plate on the gear assembly when the plates are fully meshed. Connect the high side of a VHF marker generator thru a 1000Ω carbon resistor to point ⟨J⟩. Insert resistor lead (insulate lead) through aperture provided for crystal removal. Connect low side to chassis.

Connect the synchronized sweep voltage from the sweep generator to the horizontal input of the oscilloscope for horizontal deflection. The sweep generator output lead should be terminated with its characteristic impedance, usually 50 ohms.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
37	Two 300Ω Carbon Resistors	Across UHF antenna terminals with 300Ω in each lead.	887.5MC (Use max. sweep width)	41.25MC 43.5MC 45.75MC 887.5MC	83 (164degrees on tuning dial)	Vert. Amp. (thru preamp. if needed) to point ⟨J⟩ thru detector (detector lead of Fig.3). Low side to UHF tuner chassis.	A50, A51, A52	Use low VHF and UHF marker generator output. If UHF sweep generator has no built-in marker, couple separate marker generator loosely to antenna terminals to provide UHF marker (887.5MC). Adjust A50 and A51 for maximum amplitude over-coupled response curve centered at 887.5MC similar to Fig. 9. Adjust A52 until the 43.5 MC marker coincides with the 887.5MC marker. The 41.25MC and 45.75MC markers should be symmetrically located on top of response curve as in Fig. 9.
38	"	"	473.5MC (Use max. sweep width)	41.25MC 43.5MC 45.75MC 473.5MC	14 (5 degrees on tuning dial)	"	A53, A54	Leave marker generators connected as in step 37. Adjust A53 until 43.5MC marker coincides with 473.5MC marker as in Fig.10. If A53 has insufficient range adjust A54 by repositioning coil until markers coincides. Repeat steps 37 and 38 until proper responses are obtained.

39. Tune thru the entire UHF range and check tracking. If the 41.25MC and 45.75MC markers fall below 85% on any UHF channel it will be necessary to bend the RF plates to correct mistracking. The plates may be bent by using a knife blade with the shield cover removed. Knife the plates while tuning lower in frequency so that tracking above the point of knifing will not be disturbed. A check of which requires knifing may be made by touching the plates with the knifing tool while noting the effect on the response curve, then knifing the proper section or both sections if required. Connect the DC probe of VTVM to point ⟨J⟩. Common to chassis. Tune thru the entire UHF range, at the same time noting the reading on VTVM. Readings between .03 and .4 volts should be obtained. If voltages outside this limit are obtained, it indicates low B+ voltage, low or high crystal impedance or an oscillator tube outside its allowable limits. This voltage may be varied by repositioning L3 (UHF osc. coupling coil. Connect DC probe of VTVM to point ⟨K⟩. Common to chassis. Readings between .75 and 3.5 volts should be obtained. Readings outside this range will cause crystal currents beyond allowable limits and in such cases the oscillator tube should be replaced. If the oscillator tube is replaced steps 37 and 38 should repeated.
allowable limits and in such cases, the oscillator tube should be replaced. If the oscillator tube is replaced steps 37 and 38 should be repeated.

FM TRAP ALIGNMENT

Tune in a local TV station in which interference is noticed, adjust A55 for minimum interference in the picture.

FIRST VIDEO AMPLIFIER AND BANDPASS AMPLIFIER ALIGNMENT

Remove the G-Y,R-Y demodulation tube (V25) from its socket.
Connect the negative lead of a variable bias supply to pin 6 of AGC clamper tube (6T8/V11A). Connect the positive lead to chassis. Adjust for -2 volts bias at pin 6 of V11A.
Connect a second bias supply to the ungrounded side of C76. Connect the positive lead to chassis. Adjust for -6 volts at ungrounded side of C76.

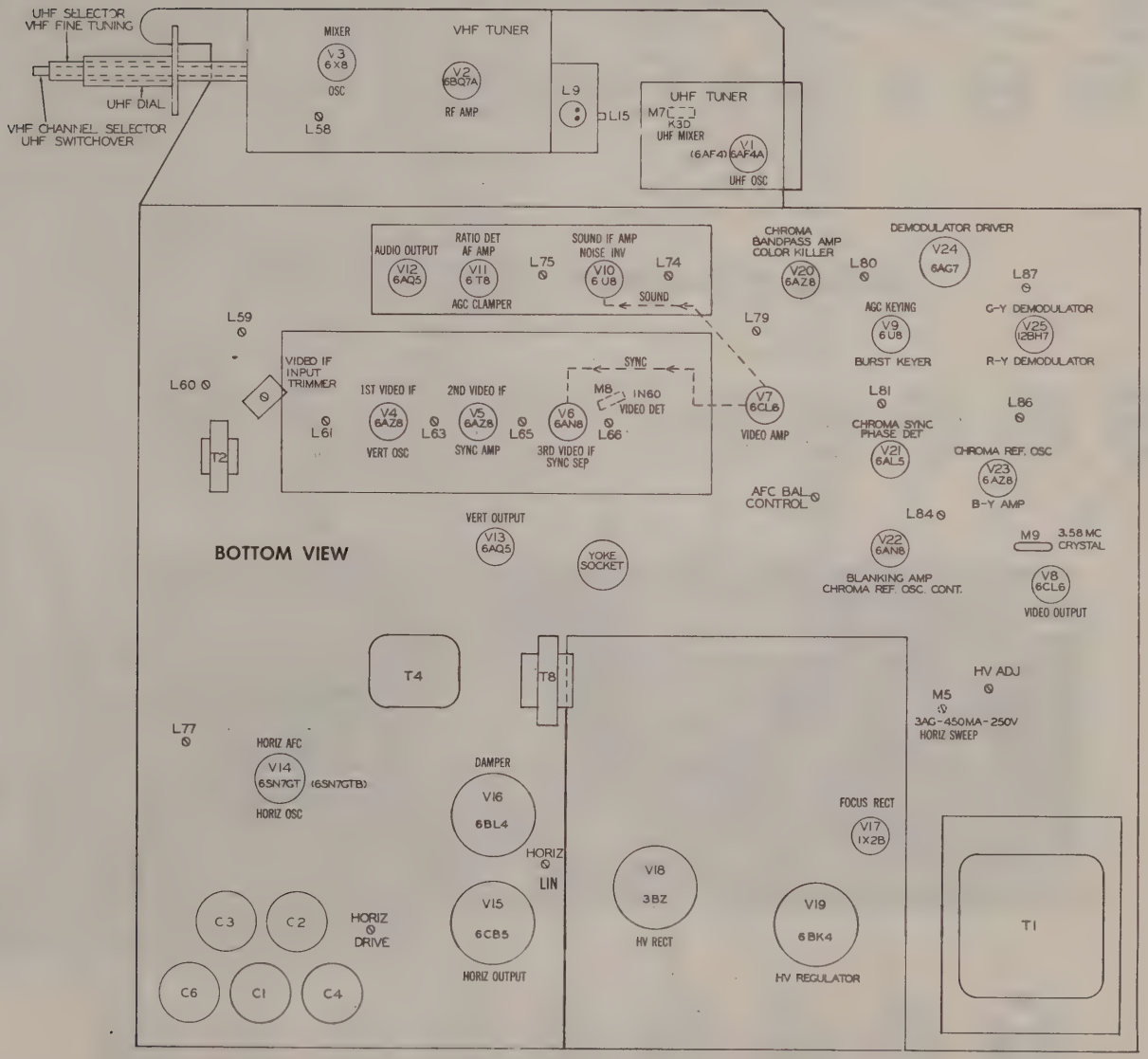
	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
40	Direct	Connect signal generator and video sweep modulator across antenna terminals. (See remarks)	3MC (3MC Swp)	3.0MC 3.58MC 4.1MC	4	Vert. Amp. of wide band scope to point ⟨D⟩. thru detector (detector lead of Fig. 3). Low side to chassis.		Signal generator should provide channel 4 video carrier frequency (67.25MC) with crystal accuracy. Connect DC probe of VTVM to pin 2 (grid) of 6CL6 (V7). Common to point ⟨D⟩. With zero video sweep modulation adjust signal generator output (67.25MC) for 1.5 volts on VTVM. Remove VTVM and apply video sweep modulation, being careful not be overload. Couple VHF signal generator loosely to pin 6 (grid) of 1st. video IF amplifier tube (V4) to provide 45.75MC marker. To set the local oscillator exactly on frequency adjust fine tuning control until a beat pattern is obtained on scope. Remove VHF generator from pin 6 of V4A. The response on scope should be similar to Fig. 11. Remove bias supplies.
41	"	"	"	3.0MC 4.1MC	"	Vert. Amp. of wide band scope thru detector (detector lead of Fig. 3). To terminal "B" of L80. Low side to chassis.	A56	Connect a 330Ω, 1 watt resistor across terminals "A" and "B" of bandpass primary coil (L80). Connect negative lead of a bias supply to pin 9 (grid) of burst keyer tube (V9B). Connect negative lead of a second bias supply to junction of R168 and R169. Connect positive terminals of both to chassis. Adjust for -7 volts at both bias points. Adjust A56 for correct response curve similar to Fig. 12. Remove 330Ω resistor from terminals "A" and "B" of L80 and connect to terminals "C" and "F" of demodulator transformer (L87) for adjustments in step 42.
42	Direct	Connect signal generator and video sweep modulator across antenna terminals. (See remarks-step 1)	"	"	"	Vert. amp. of wide band scope thru detector (detector lead of Fig.3) to terminal "F" of L87. Low side to chassis.	A57, A58	Connect both bias supplies as in step 41. At pin 9 of V9B increase bias to -9 volts. At junction of R168 and R169 increase bias to -15 volts. Adjust A57 and A58 for response curve similar to Fig.13. If necessary, make SLIGHT readjustment of A7 for desired response. Remove 330Ω from terminals "C" and "F" of L87.
43	"	"	"	"	"	Vert. Amp. of wide band scope thru 2MMF capacitor and detector (detector lead of Fig.3) to pin 1 (plate) of R-Y demodulated (V25B). Low side to chassis.	A59	Adjust A59 for response similar to Fig.14. In step 42, if adjustment of A7 required readjustment for desired response, repeat step 14 for a check of the overall IF response check with response curves similar to Fig.5. Replace fuse (M3) in its fuse holder. Remove 1500Ω, 10 watt resistor from pin 7 of deflection yoke socket and high side of R8A (B- line).

ALIGNMENT INSTRUCTIONS (cont)

COLOR AFC ALIGNMENT

Connect a 100% saturated color bar generator across the antenna terminals (a TV color signal may be used if available).
Connect the negative lead of a 15 volt bias supply to point D . Connect the positive lead to chassis.
Turn the channel selector to correct channel (whichever crystal that was supplied with the generator) or correct channel for TV color signal. Adjust horizontal hold control of the generator until color is in sync.

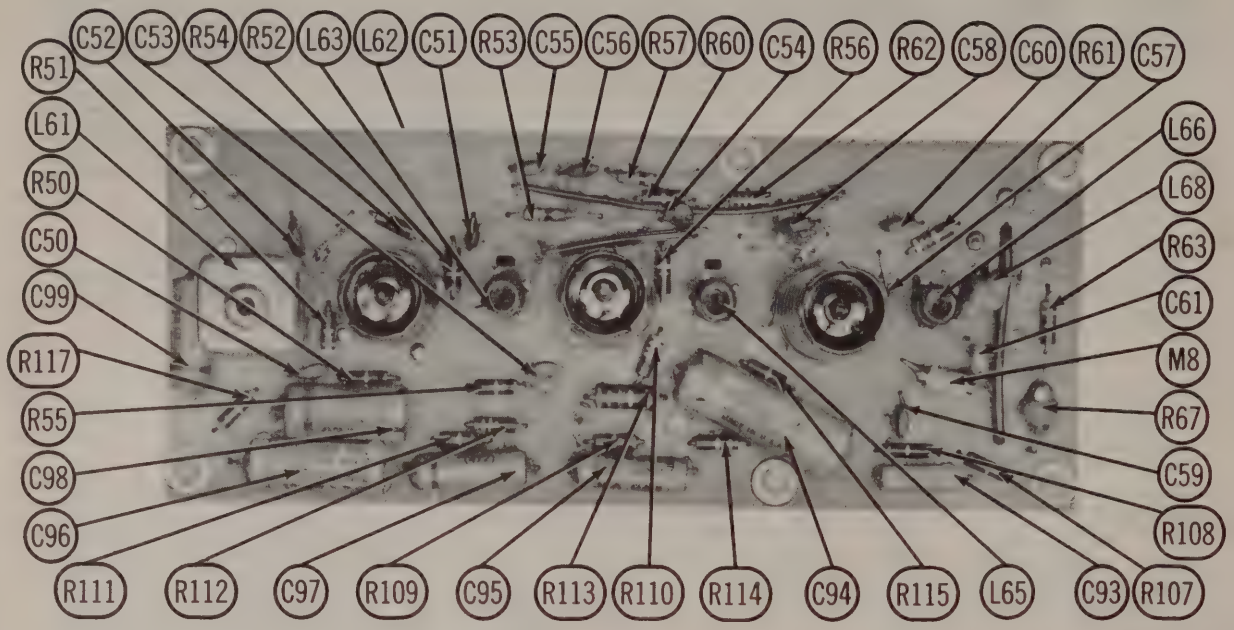
	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	CHANNEL	CONNECT VTVM	ADJUST	REMARKS
44.	Direct	Use color bar generator. Across antenna terminals.			DC probe to pin 7 (plate) of color phase detector (V21). Common to chassis.	A60, A61, A62	Connect a short jumper from terminal "C" of bandpass primary coil (L80) to chassis. Adjust A60 for maximum deflection on VTVM. Set the hue control to its mid-range position and adjust A61 for maximum deflection. Remove short from terminal "C" of L80 and chassis. Then adjust A62 for maximum deflection.
45.	"	"			Vert. Amp. to pin 2 (red grid) of picture tube. Low side to chassis.	A63	Connect a clip lead from point Ⓜ to chassis. Adjust A63 for zero indication on scope. Remove clip lead from point Ⓜ and chassis.
46.	"	"			DC probe to point Ⓜ. Common to chassis.	R20	Connect a 10 to 15MMF capacitor across 3.58MC crystal (M9). Adjust AFC control (R20) for zero deflection on VTVM. Remove capacitor from across M9 and adjust the color control (R2) for color sync.



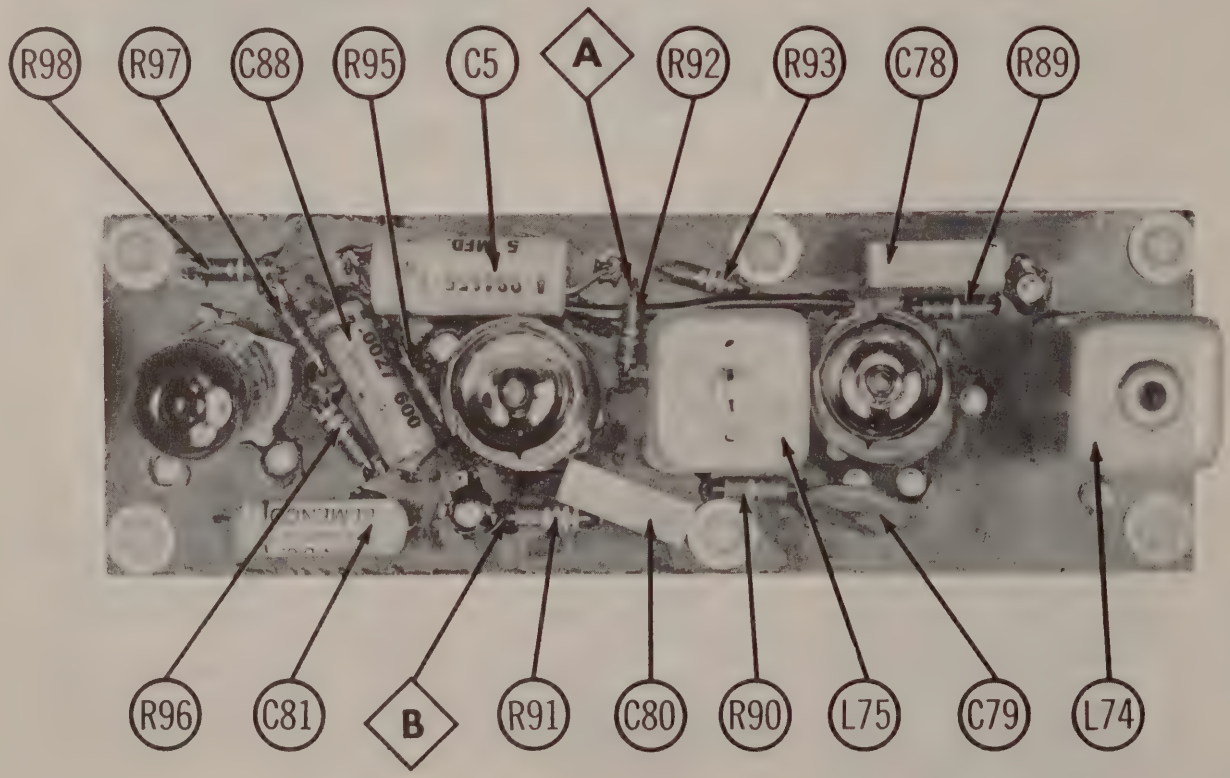
MAGNAVOX
CHASSIS CMUD477AA

TUBE PLACEMENT CHART

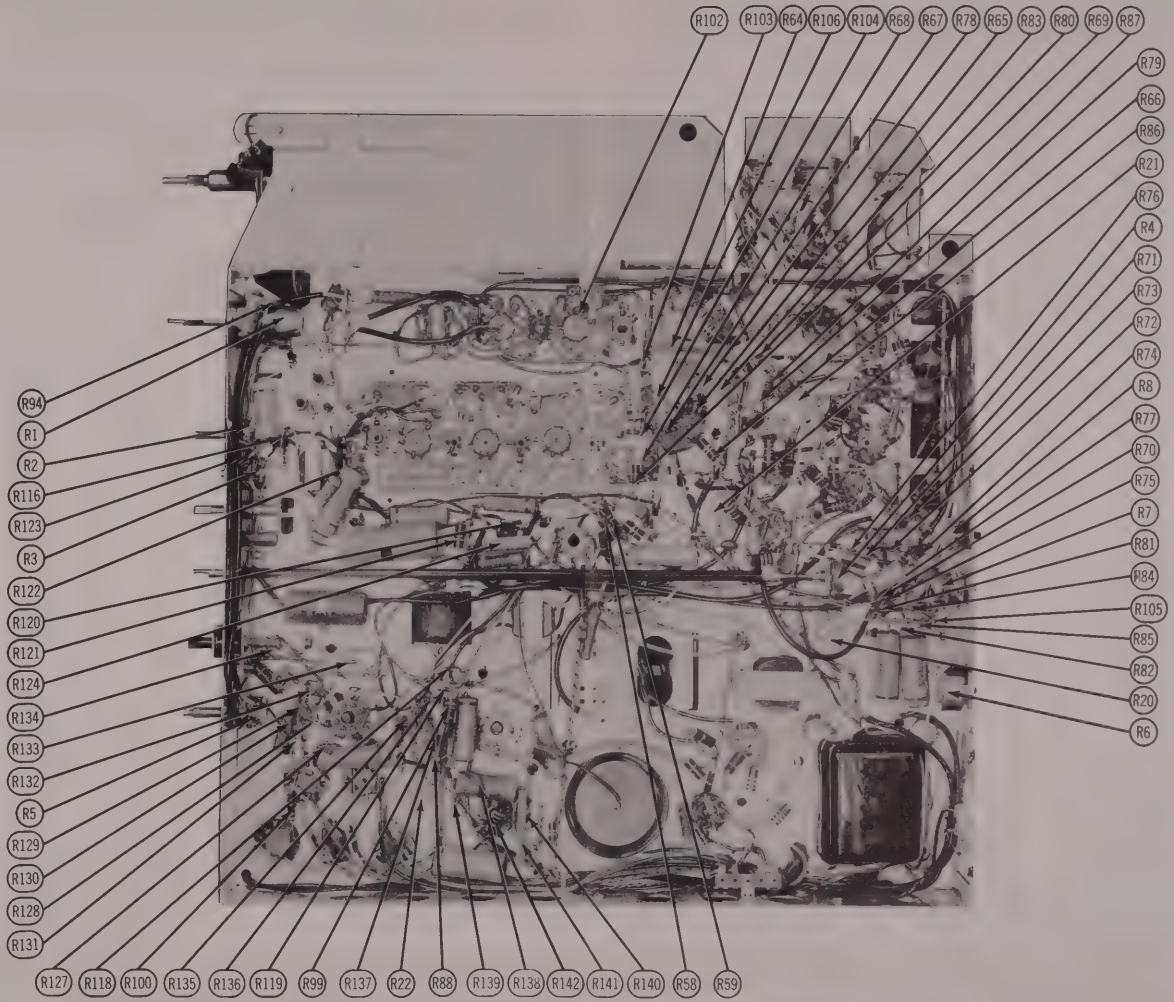
SET 323 FOLDER 8



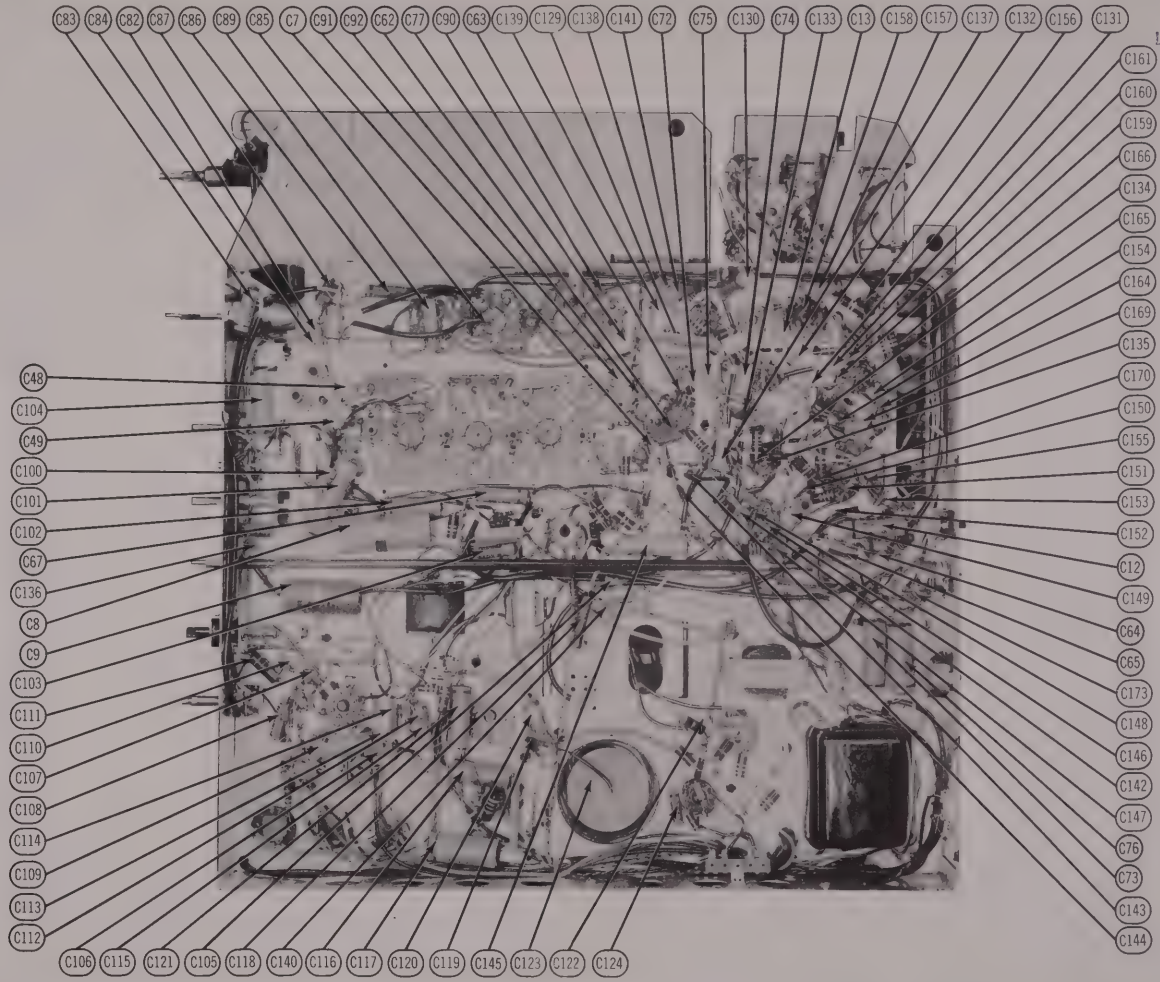
VIDEO IF SUB-CHASSIS PRINTED CIRCUIT



SOUND IF SUB-CHASSIS PRINTED CIRCUIT

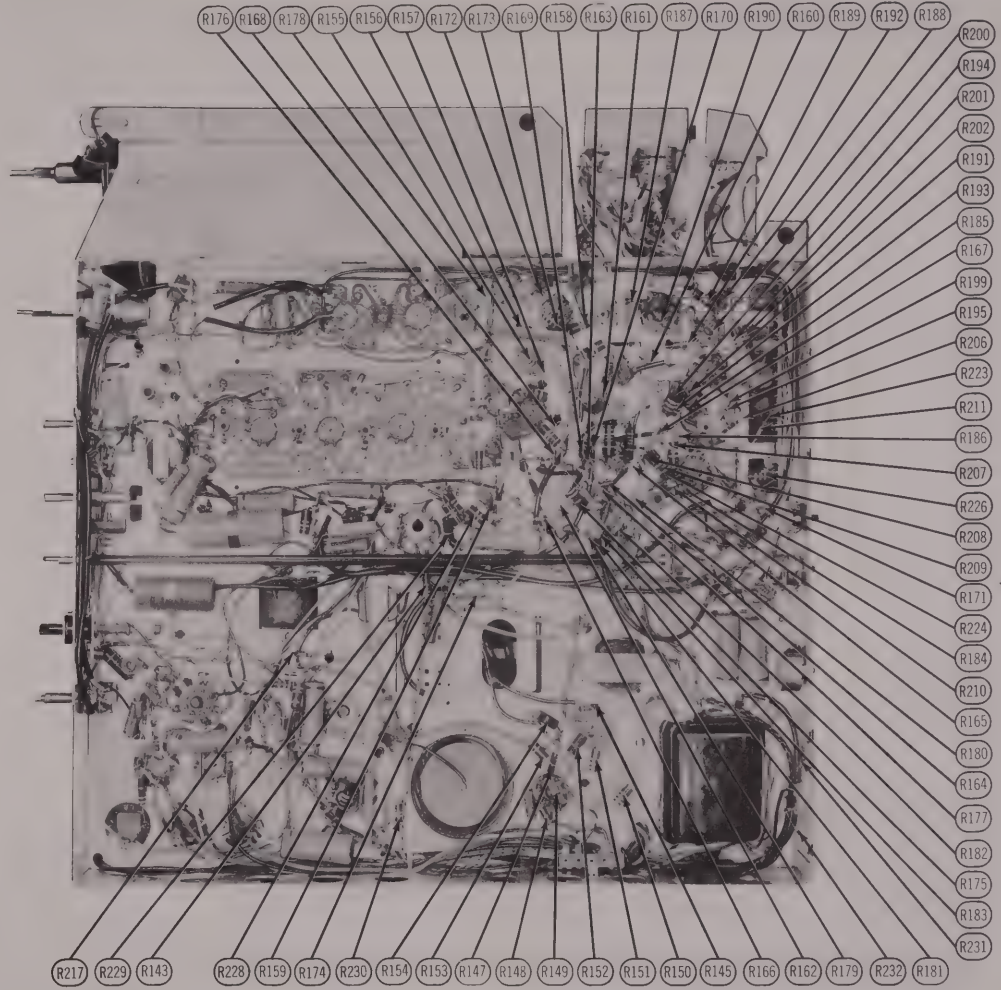


CHASSIS BOTTOM VIEW RESISTOR IDENT. (R1-R142)



CHASSIS BOTTOM VIEW-CAPACITOR IDENTIFICATION

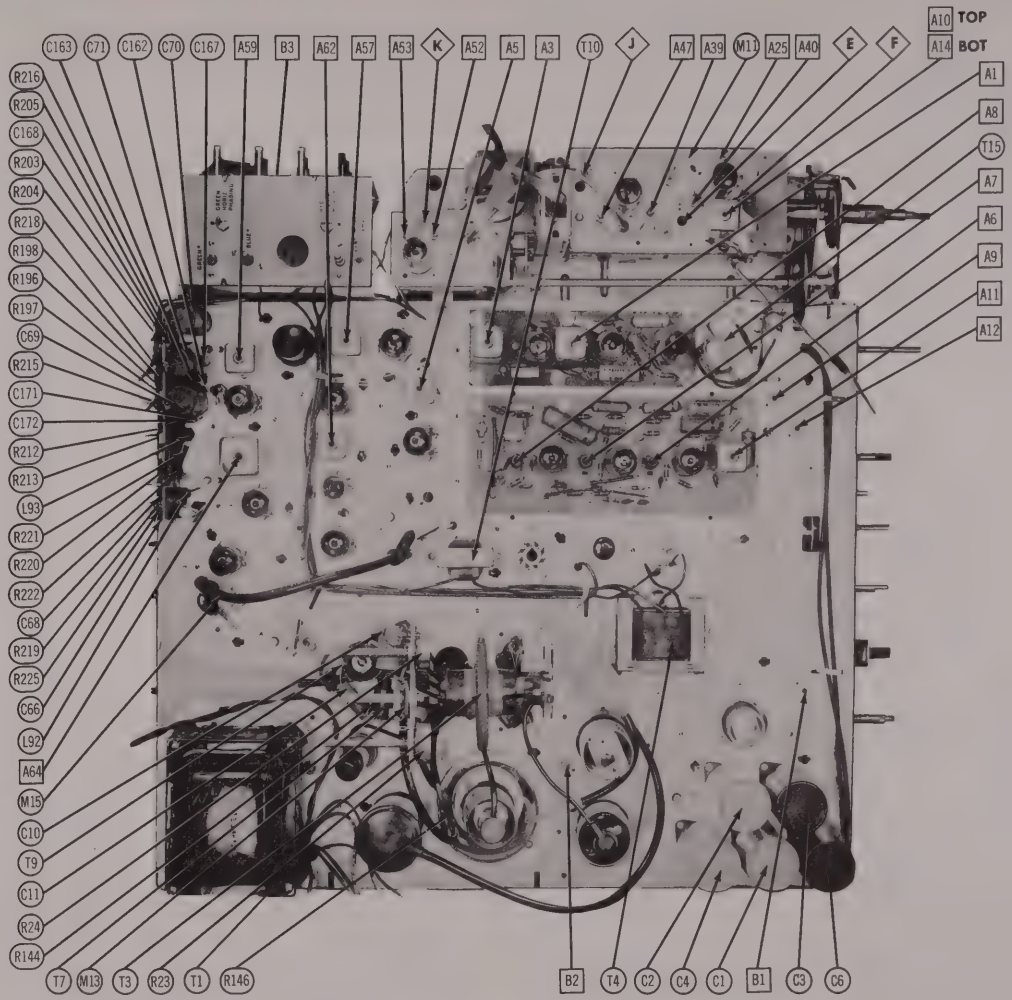
MAGNAVOX
CHASSIS CMUD477AA



CHASSIS BOTTOM VIEW RESISTOR IDENT. (R143-R232)

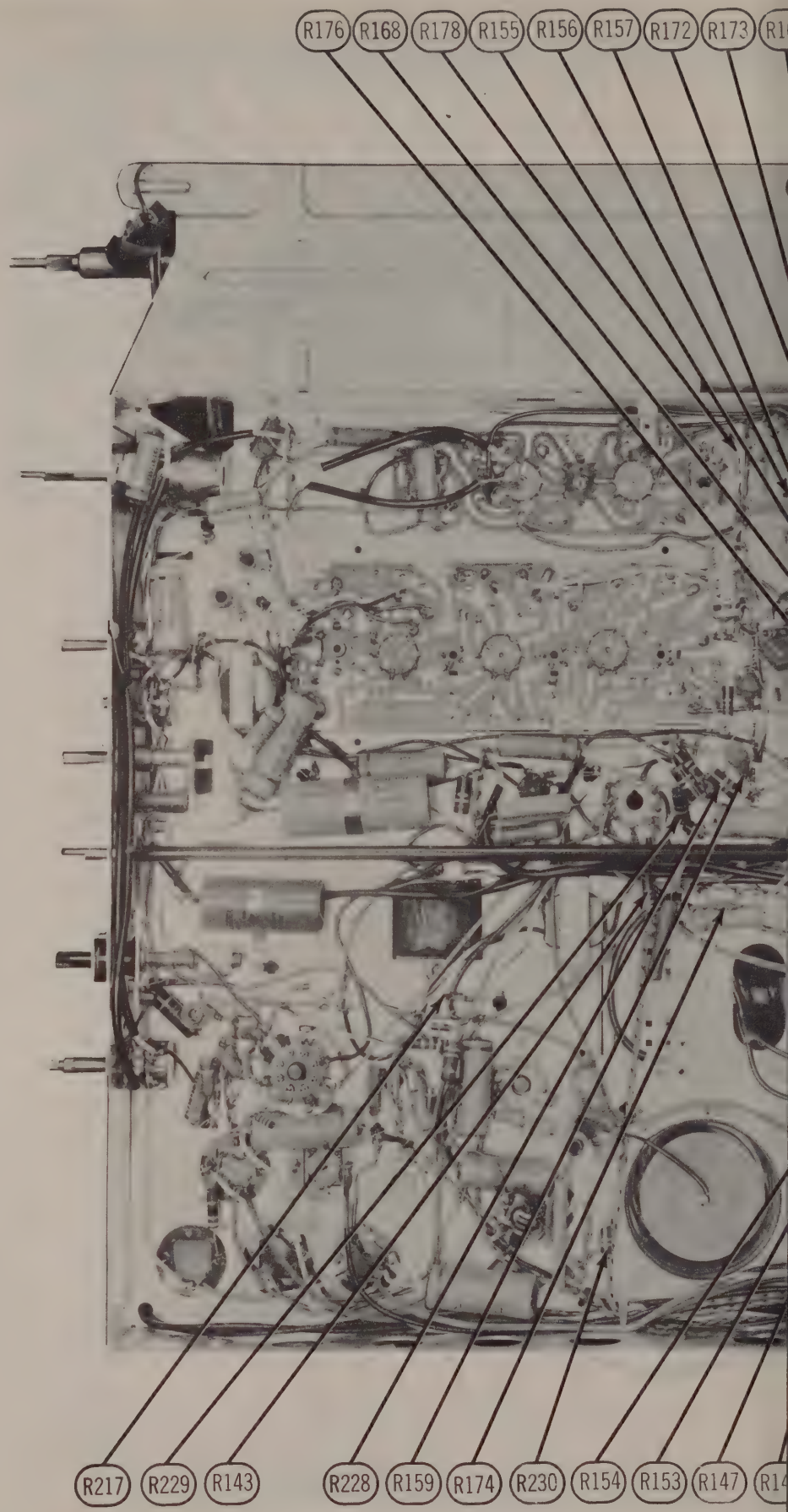
MAGNAVOX
CHASSIS CMUD477AA

SET 323 FOLDER 8

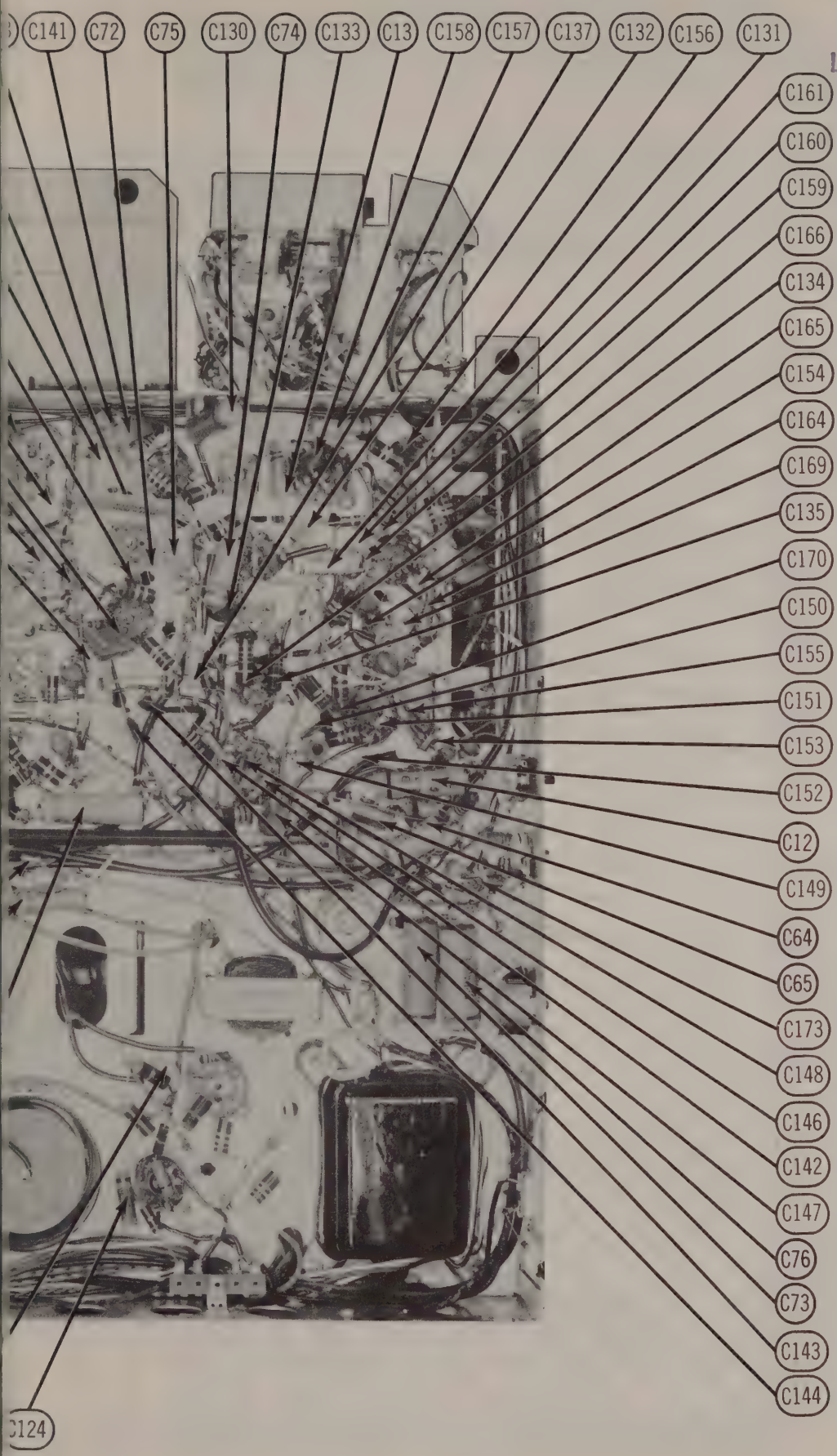


CHASSIS TOP VIEW

MAGNAVOX
CHASSIS CMUD477AA



CHASSIS BOTTOM VIEW



PROPERTY OF
L. F. BLANKENSHIP
3084 MEADE ST.
DENVER, COLORADO

ACITOR IDENTIFICATION

CHASSIS BOTTOM VIEW R

TV PARTS LIST AND DESCRIPTIONS (Continued)

CAPACITORS (cont)

ITEM No.	RATING CAP	RATING VOLT	REPLACEMENT DATA MAGNAVOX PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	NOTES
C144	4700			BPD-0047	DD-472	K079	811-0047	DC-536	5HK-D47	Note 4
C145	.22	200	M78905	P288N-22		CUB2P22		PT4022	2TM-P22	
C146	2		M79993	NP0-2I3.2	TCZ-2R2	TZ05	NP0A-2R2		5TCCB-V22	
C147	10000		M73960	BPD-01	DD-103	K082	811-01	DC-511	5HK-S1	
C148	10000		M73960	BPD-01	DD-103	K082	811-01	DC-511	5HK-S1	
C149	2		M100925							
C150	10000		M73960	BPD-01	DD-103	K082	811-01	DC-511	5HK-S1	
C151	120		M71614	SI120	D6-121	TP25	GP2K-121	UC-5313	5GA-T12	
C152	4		M100926							
C153	270	500	M39038	NP0-SI270	TCZ-270	5R5T27	NP0-335-271	MCE241	MS-327	
C154	10000		M73960	BPD-01	DD-103	K082	811-01	DC-511	5HK-S1	
C155	10000		M73960	BPD-01	DD-103	K082	811-01	DC-511	5HK-S1	
C156	10000		M73960	BPD-01	DD-103	K082	811-01	DC-511	5HK-S1	
C157	.01	400	M73561	BPD-01	D6-103	CUB4S1	GP3-333-103	PT411	4TM-S1	
C158	10000		M73960	BPD-01	DD-103	K082	811-01	DC-511	5HK-S1	
C159	.0047	400	M79017	SI4700	D6-472	CUB5D47	GP3-333-472	PT6347	6TM-D47	
C160	15		M39041		TCN-15	TN04	N750K-150			
C161	39		M73564	SI39	D6-390	TP25	GP1K-390	UC-5439	5GA-Q39	
C162	8		M78228			TP08				
C163	10000		M73960	BPD-01	DD-103	K082	811-01	DC-511	5HK-S1	
C164	.0047	400	M79017	SI4700	D6-472	CUB5D47	GP2-333-222	PT6347	6TM-D47	
C165	15		M39041	SI15	D6-150	TP12	GP1K-150	UC-5416	5GA-Q15	
C166	39		M73564	SI39	D6-390	TP25	GP1K-390	UC-5439	5GA-Q39	
C167	15		M39041		TCN-15	TN04	N750K-150			
C168	10000		M73960	BPD-01	DD-103	K082	811-01	DC-511	5HK-S1	
C169	3		M100925							
C170	270	500	M 69483	1469-00027	D6-271	5R5T27	811-271	MCE241	MS-327	
C171	15		M39041		TCN-15	TN04	N750K-150			
C172	10000		M73960	BPD-01	DD-103	K082	811-01	DC-511	5HK-S1	
C173	.0027	500								Note 2

Note 2. Not used in some versions.
Note 3. Some versions use .0023MFD in this application (Part #73808).
Note 4. Some versions use 10000MMF in this application (Part #73561).

CONTROLS

ITEM No.	RATING RESISTANCE	RATING WATTS	REPLACEMENT DATA MAGNAVOX PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	IRC PART No.	MALLORY PART No.	INSTALLATION NOTES
R1A	200Ω	2	M100383	F7-50			UE386	Brightness - Panel
B	1Meg	½		R2-57				Volume Tapped at 200K -Rear
C	Switch			KS-4				Attach to R1B.
R2A	2000Ω	½	M100382	B-5	A47-2000-S	Q11-110	U-6	Color
B	Shaft		Not Req.	Not Req.	FS-3	Not Req.	Not Req.	Attach to R2A.
R3A	2.5Meg	½	M100390	F1-76		*QJ-853	UE382	Height-Panel
B	1000Ω	½		R2-5				Vert. Linearity - Rear
R4A	2000Ω	½	M100381	A-102	A47-2000-S		U-6	Contrast
B	Shaft		Not Req.	Not Req.	FS-3	Not Req.	Not Req.	Attach to R4A.
R5A	1.5Meg	½	M100384	F1-64		**QJ-855	UF155L) †	Vert. Hold - Panel
B	2.5Meg	½		R2-77			UR255L)	Tone - Rear
R6A	1500Ω	2	M100386	VK-130	A43-1500	WK-1500	R1500L	Vert. Centering -Wire Wound
B	Shaft		Not Req.	Not Req.	FKS-1/4	Not Req.	Not Req.	Attach to R6A.
R7A	500KΩ	½	M100389	F1-60		* QJ-852	UE1492	ACC - Panel
B	2.5Meg	½		R2-75				Noise Inverter - Rear
R8A	500KΩ	½	M78808	BX-59	A47-500K-S	B11-133	TA55L	Killer Threshold
B	Shaft		Not Req.	Not Req.	FKS-½	TM-2 Kit	Not Req.	Attach to R8A.
R9A	100Ω	½	M100388				UE-39	Green Vert. Tilt- Panel
B	100Ω	½						Green Vert. Amplitude - Rear
R10A	100Ω	½	M100388				UE-39	Blue Vert. Tilt-Panel
B	100Ω	½						Blue Vert. Amplitude-Rear
R11A	100Ω	½	M100388				UE-39	Red Vert. Tilt-Panel
B	100Ω	½						Red Vert. Amplitude-Rear
R12A	1500Ω	½	M100392	AB-6	A47-1500-S	Q11-109	TA152L	Green Horiz. Amplitude
B	Shaft		Not Req.	AK-4	KS8-3	Not Req.	Not Req.	Attach to R12A.
R13A	1500Ω	½	M100393	AB-6	A47-1500-S	Q11-109	TA152L	Blue Horiz. Amplitude
B	Shaft		Not Req.	AK-4	KS8-3	Not Req.	Not Req.	Attach to R13A.
R14A	1500Ω	½	M100392	AB-6	A47-1500-S	Q11-109	TA152L	Red Horiz. Amplitude
B	Shaft		Not Req.	AK-4	KS8-3	Not Req.	Not Req.	Attach to R14A.
R15A	500KΩ	½	M100391	AB-59	A47-500K-S	Q11-133	TA55L	Green Background
B	Shaft		Not Req.	AK-1	KS8-3	Not Req.	Not Req.	Attach to R15A.
R16A	500KΩ	½	M100391	AB-59	A47-500K-S	Q11-133	TA55L	Blue Background
B	Shaft		Not Req.	AK-1	KS8-3	Not Req.	Not Req.	Attach to R16A.
R17A	500KΩ	½	M100391	AB-59	A47-500K-S	Q11-133	TA55L	Red Screen
R1 B	Shaft		Not Req.	AK-1	KS8-3	Not Req.	Not Req.	Attach to R17A.
R18A	500KΩ	½	M100391	AB-59	A47-500K-S	Q11-133	TA55L	Blue Screen
B	Shaft		Not Req.	AK-1	KS8-3	Not Req.	Not Req.	Attach to R18A.
R19A	500KΩ	½	M100391	AB-59	A47-500K-S	Q11-133	TA55L	Green Screen
B	Shaft		Not Req.	AK-1	KS8-3	Not Req.	Not Req.	Attach to R19A.
R20A	250KΩ	½	M100387	AB-50	A47-250K-S	Q11-130	TA254L	E. V. Adjustment
B	Shaft		Not Req.	AK-4	KS8-3	Not Req.	Not Req.	Attach to R20A.
R21A	250KΩ	½	M100387	AB-50	A47-250K-S	Q11-130	TA254L	AFC Balance
B	Shaft		Not Req.	AK-4	KS8-3	Not Req.	Not Req.	Attach to R21A.
R22A	250KΩ	½	M100387	AB-50	A47-250K-S	Q11-130	TA254L	Horiz. Drive
B	Shaft		Not Req.	AK-4	KS8-3	Not Req.	Not Req.	Attach to R22A.
R23	250KΩ	1	M100396					Focus
R24	100Ω	½	M100395					Horiz. Centering

* Concentrikit Equivalent; K-15 Kit, Base Elements and Shafts; B11-239, P19-016 B17-108, R15-009
** Concentrikit Equivalent; K-6 Kit, Base Elements and Shafts; B11-138, P20-104 B11-239, R11-112
♦ Concentrikit Equivalent; K-15 Kit, Base Elements and Shafts; B11-133, P19-012 B11-239, R15-005
† Universal Replacement (Mallory Exact Duplicate Part No. UE1899).

RESISTORS

ITEM No.	RATING OHMS	RATING WATT	REPLACEMENT DATA MAGNAVOX PART No.	IRC PART No.	NOTES
R25	4700Ω	½	M502247		
R26	3300Ω	½	M502233	BTS-3300	
R27	6800Ω	1	M512268		
R28	1000Ω	½	M502210	BTS-1000	
R29	10KΩ	½	M502310	BTS-10K	
R30	100Ω	½	M502110	BTS-100	
R31	120Ω	½	M502112	BTS-120	
R32	100KΩ	½	M502410	BTS-100K	
R33	100KΩ	½	M502410	BTS-100K	
R34	1Meg	½	M502510	BTS-1Meg	
R35	1Meg	½	M502510	BTS-1Meg	
R36	1000Ω	½	M502210	BTS-1000	
R37	100KΩ	½	M502410		
R38	10Ω	½		BTS-10	
R39	100KΩ	½	M502410		
R40	3300Ω	½	M502233	BTS-3300	
R41	100KΩ	½	M502410		
R42	12KΩ	1	M522312		
R43	10KΩ	1	M512310	BTA-10K	
R44	120Ω	½	M502112	BTS-120	
R45	6800Ω	2	M522268	BTB-6800	
R46	56KΩ	½	M502356	BTS-56K	
R47	3900Ω	½	M502239	BTS-3900	
R48	470KΩ	½	M502447	BTS-470K	
R49	1000Ω	1	M512210	BTA-1000	
R50	1000Ω	½	M502210	BTS-1000	
R51	4700Ω 5%	½	M502247		
R52	100KΩ 5%	½	M502410		
R53	1000Ω	½	M502210	BTS-1000	Note 1
R54	68Ω 5%	½	M502068	BTS-68 5%	

RESISTORS (cont)

ITEM No.	RATING OHMS	RATING WATT	REPLACEMENT DATA MAGNAVOX PART No.	IRC PART No.	NOTES
R55	1000Ω	½	M502210	BTS-1000	
R56	100K 5%	½	M502410		
R57	1000Ω	½	M502210	BTS-1000	Note 1
R58	10KΩ	2	M522310	BTB-10K	Note 2
R59	10KΩ	2	M522310	BTB-10K	Note 2
R60	68Ω 5%	½	M502068	BTS-68 5%	
R61	470Ω	½	M502147	BTS-470	
R62	180Ω 5%	½	M502218	BTS-180 5%	
R63	3300Ω 5%	½	M502233	BTS-3300 5%	
R64	5000Ω	10	M100448	PW10-5000	
R65	22KΩ	2	M522322		
R66	12KΩ	2	M522312		
R67	33Ω	½	M502033	BTS-33	
R68	1800Ω	½	M502218	BTS-1800	
R69	1200 5%	1	M512212	BTS-1200 5%	
R70	100KΩ	½	M502410	BTS-100K	
R71	82KΩ	½	M502382	BTS-82K	
R72	5600Ω	½	M502256	BTS-5600	
R73	18KΩ	2	M522318	BTB-18K	
R74	33KΩ	2	M522333	BTB-33K	
R75	15KΩ	2	M522315	BTB-15K	
R76	100Ω	½	M502110	BTS-100	
R77	68Ω	½	M502068	BTS-68	Note 2
R78	82KΩ	½	M502382	BTS-82K	
R79	27KΩ	½	M502327	BTS-27K	
R80	100KΩ	2	M522410	BTB-100K	
R81	1Meg	½	M502510	BTS-1Meg	
R82	120KΩ 5%	½	M502412	BTS-120K	
R83	18KΩ	½	M502318	BTS-18K	
R84	150KΩ 5%	½	M502415	BTS-150K 5%	
R85	33KΩ 5	½	M502333	BTS-33K 5%	
R86	47KΩ	½	M502347	BTS-47K	
R87	33KΩ	½	M502333	BTS-33K	
R88	8200Ω	½	M502282	BTS-8200	
R89	1800Ω	½	M502218	BTS-1800	
R90	120Ω	½	M502112	BTS-120	
R91	39KΩ	½	M502339	BTS-39K	
R92	150Ω 5%	½	M502115	BTS-150 5%	
R93	27KΩ 5%	½	M502327	BTS-27K 5 %	
R94	22KΩ	½	M502322	BTS-22K	
R95	10Meg	½	M502810	BTS-10Meg	
R96	330KΩ	½	M502433	BTS-330K	
R97	1.5Meg	½	M502515	BTS-1.5Meg	Note 3
R98	820KΩ	½	M502482	BTS-820K	
R99	470Ω	2	M522147	BTB-470	
R100	47Ω	1	M512047	BTA-47	
R101	3.3Meg	½	M502533	BTS-3.3Meg	Note 3
R102	470KΩ	½	M502447	BTS-470K	
R103	18KΩ	½	M502318	BTS-18K	
R104	330Ω	½	M502133	BTS-330	
R105	270KΩ	½	M502427	BTS-270K	
R106	270KΩ	½	M502427	BTS-270K	
R107	1.5Meg	½	M502515	BTS-1.5Meg	
R108	1.5Meg	½	M502515	BTS-1.5Meg	
R109	1Meg	½	M502510	BTS-1Meg	
R110	33KΩ	½	M502333	BTS-33K	
R111	5600Ω	½	M502256	BTS-5600	
R112	27KΩ	½	M502327	BTS-27K	
R113	8200Ω 5%	1	M512282	BTA-8200 5%	
R114	2700Ω	½	M502227	BTS-2700	
R115	2.2Meg	½	M502522	BTS-2.2Meg	Note 4
R116	1Meg	½	M502510	BTS-1Meg	
R117	2.2Meg	½	M502523	BTS-2.2Meg	
R118	2.7Meg	½	M502527	BTS-2.7Meg	
R119	1Meg	½	M502510	BTS-1Meg	
R120	2.2Meg	½	M502522	BTS-2.2Meg	
R121	56KΩ	2	M522356	BTB-56K	
R122	15KΩ 5%	½	M502315	BTS-15K 5%	
R123	270Ω	1	M512127	BTA-270	
R124	2500Ω	7	M100444	PW7-2500	
R125	1200Ω 5%	1			
R126	1200Ω 5%	1			
R127	330KΩ	½	M502433		
R128	820KΩ	½	M502482	BTS-820K	
R129	82KΩ	1	M512382	BTA-82K	
R130	150KΩ 5%	1	M513415	BTA-150K 5%	
R131	3900Ω	½	M502239		
R132	100KΩ 5%	1	M512410	BTA-100K 5%	
R133	5.3Meg	½	M502553		
R134	68KΩ	½	M502368		
R135	150KΩ	½	M502415		
R136	39KΩ	1	M513339		
R137	150KΩ	½	M502415		
R138	120Ω	1	M512112	BTS-120	
R139	470KΩ	½	M502447		
R140	56Ω	½	M502056	BTS-56	
R141	11KΩ	10	M79987	1 ¾A-11K	
R142	47Ω	2	M522147		
R143	4700Ω 5%	1	M512347		
R144	22Ω	1	M513022		

Note 1. Some versions use a 10KΩ ½W resistor in this application.
Note 2. Not used in some versions.
Note 3. Some versions use a 1.2Meg ½W resistor in this application.
Note 4. Some versions use a 1.5Meg ½W resistor in this application.

RESISTORS (cont)

ITEM No.	RATING OHMS	RATING WATT	REPLACEMENT DATA MAGNAVOX PART No.	IRC PART No.	NOTES
R145	3.3Ω 5%	½	M100938	BW½-3.3 5%	
R146	3.3Ω 5%	½	M100938	BW½-3.3 5%	
R147	2.2Meg 5%	1	M512522		
R148	1.5Meg 5%	1	M512518		
R149	100Meg	1	M512710		
R150	470KΩ	2	M522447		
R151	470KΩ	2	M522447		
R152	10Meg	2	M522610		
R153	10Meg	2	M522610		
R154	10Meg	2	M522610		
R155	10KΩ	1	M502310	BTS-10K	
R156	3900Ω	½	M502239	BTS-3900	
R157	2200Ω	½	M502222	BTS-2200	
R158	10KΩ	2	M522310	BTB-10K	
R159	2.2Meg	½	M502522	BTS-2.2Meg	
R160	3300Ω	2	M522233	BTB-3300	
R161	1000Ω	½	M502210	BTS-1000	
R162	10KΩ	½	M502310	BTS-10K	Note 2
R163	1Meg 5%	½	M502510		
R164	1Meg 5%	½	M502510		
R165	3.9Meg	1	M502539		
R166	33KΩ	½	M502333		
R167	10KΩ	½	M502310	BTS-10K	
R168	560KΩ 5%	½	M502456	BTS-560K 5%	
R169	2.2Meg 5%	½	M502522	BTS-2.2Meg 5%	
R170	2.2Meg 5%	½	M502522	BTS-2.2Meg 5%	
R171	18Meg	½	M502618	BTS-18Meg	
R172	33KΩ	1	M512333	BTA-33K	
R173	33KΩ	2	M522333	BTB-33K	
R174	27KΩ	½	M502327	BTS-27K	
R175	3900Ω	2	M522239	BTB-3900	
R176	120Ω	½	M502112	BTS-120	
R177	560Ω	½	M502156	BTS-560	
R178	4700Ω	½	M502247	BTS-4700	
R179	8200 5%	½	M502182	BTS-820 5%	
R180	2200Ω	½	M502222	BTS-2200	
R181	47KΩ	2	M522347	BTB-47K	
R182	27KΩ	1	M512327	BTA-27K	
R183	470Ω	½	M502147	BTS-470	
R184	47KΩ	½	M502347	BTS-47K	
R185	1000Ω	½	M502210	BTS-1000	
R186	47KΩ	1	M512347	BTA-47K	
R187	56Ω	½	M502056	BTS-56	
R188	560Ω	1	M512156	BTA-560	
R189	10KΩ	2	M522310	BTB-10K	
R190	220Ω	½	M502122	BTS-220	
R191	2200Ω	½	M502222	BTS-2200	
R192	3300Ω	1	M512233	BTA-3300	
R193	56KΩ	2	M522356	BTB-56K	
R194	56KΩ	2	M522356	BTB-56K	
R195	120KΩ 5%	½	M502112	BTS-120K 5%	
R196	3300Ω	½	M502233	BTS-3300	
R197	150KΩ	½	M502415	BTS-150K	
R198	270KΩ 5%	½	M502427	BTS-270K	
R199	2200Ω	2	M522222	BTB-2200	
R200	1500Ω	1	M512215	BTA-1500	
R201	56KΩ	2	M522356	BTB-56K	
R202	56KΩ	2	M522356	BTB-56K	
R203	3300Ω	½	M502233	BTS-3300	
R204	180KΩ	½	M502418	BTS-180K	
R205	180KΩ	½	M502418	BTS-180K	
R206	56KΩ 5%	1	M512356	BTS-56K 5%	
R207	15KΩ 5%	2	M522315	BTB-15K 5%	
R208	82KΩ 5%	2	M522382	BTB-82K 5%	
R209	82KΩ 5%	2	M522382	BTB-82K 5%	
R210	2700Ω 5%	2	M522227	BTB-2700 5%	
R211	2200Ω	½	M502222	BTS-2200	
R212	220KΩ	½	M502422	BTS-220K	
R213	180KΩ	½	M502418	BTS-180K	
R214	56KΩ	2	M522356	BTB-56K	
R215	100KΩ	2	M522410	BTB-100K	
R216	100KΩ	2	M522410	BTB-100K	
R217	10KΩ	½	M502310	BTS-10K	
R218	100KΩ	2	M522410	BTB-100K	
R219	510Ω 5%	1	M512151	BTA-510 5%	
R220	510Ω 5%	1	M512151	BTA-510 5%	
R221	1500Ω 5%	2	M522215	BTB-1500 5%	
R222	1500Ω 5%	2	M522215	BTB-1500 5%	
R223	470Ω	1	M512147	BTA-470	
R224	180Ω	½	M502118	BTS-180	
R225	3300Ω	2	M502233	BTS-3300	
R226	180KΩ	1	M512418	BTA-180K	
R227	500Ω	30	M100304	2D-500	
R228	100Ω	2	M522110	BTB-100	
R229	100Ω	2	M522110	BTB-100	
R230	10KΩ	1	M512310	BTA-10K	
R231	56KΩ	½	M502356	BTS-56K	
R232	56KΩ	1	M502356	BTS-56K	

TRANSFORMER (POWER)

ITEM No.	RATING PRI.	RATING SEC. 1	RATING SEC. 2	RATING SEC. 3	REPLACEMENT DATA MAGNAVOX PART No.	Halldorson PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No
T1	117VAC @ 3.6A	170VAC @ .640 ADC	6.3VAC @ 1.92A	6.3VAC @ 3A SEC. 4 6.3VAC @ 11.6A	M100432					

TRANSFORMERS (SWEEP CIRCUITS)

ITEM No	USE	REPLACEMENT DATA MAGNAVOX PART No.	Halldorson PART No.	Merit PART No.	RCA TYPE No.	Rem PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.
T2	Vert. Osc. Trans.	M79379	B6702	A-3003	209TK①	V405	A-8125	26A03	A-97X
T3	Horiz. Output Trans.	M100409							
T4	Vert. Output Trans.	M100428							
T5A	Yoke-Horiz. (12MH)	M100711 ②							
B	Vert. (10MH)								
T6	Horiz. Lin. Coil (.25-1.1MH C T)	M100414							
T7	Width Choke (.5MH)	M79787A							
T8	Vert. Centering Choke	M78900							
T9	Horiz. Centering Choke	M100415							
T10	Vert. Convergence Choke	M100413							
T11	Green Horizontal Phasing Coil	M100429							
T12	Blue Horizontal Phasing Coil	M100429							
T13	Red Horizontal Phasing Coil	M100429							
T14A	Green) Dynamic	M100974 ③							
B	Blue) Convergence	M100957 ④							
C	Red) Yoke Assy.								

① Drill new mounting hole(s).
② Includes capacitor C126, resistors R125 and R126, and an 8 contact male connector.
③ Exciter coil and pole piece assembly (3 used).
④ Control magnet and knob assembly (3 used).

TRANSFORMER (AUDIO OUTPUT)

ITEM No	IMPEDANCE PRI.	IMPEDANCE SEC.	REPLACEMENT DATA MAGNAVOX PART No	Halldorson PART No	Merit PART No	Stancor PART No	Thordarson PART No	Triad PART No	NOTES
T15	7.6KΩ	3.5Ω	M100037	Z1003	A-3020	A-3878	26S48	S-9Z	① Drill one new mtg. hole.

COILS (RF-IF)

ITEM No.	USE	DC RES. PRI.	DC RES. SEC.	REPLACEMENT DATA MAGNAVOX PART No.	MEISSNER PART No.	MERIT PART No.	MILLER PART No.	NOTES
L1	UHF Ant. Coil	0Ω		M79564				
L2	UHF Mixer Coupling Coil	0Ω						
L3	UHF Osc. Coupling Coil	0Ω		M79565				
L4	FIL Choke	0Ω		M79565				
L5	FIL Choke	0Ω		M79565				
L6	Cathode Choke	0Ω						
L7	UHF Osc. Shunt Coil	0Ω		M79566				Not used in some versions.
L8	UHF IF Coil	0Ω		M79567				.15 Microhearies
L9	VHF Ant. Matching Trans.	.6Ω	.4Ω	M100454				Note 1
L10	VHF Ant. Matching Trans.	.6Ω	.4Ω	M100454				Note 1
L11	IF Trap	0Ω		M100454				Note 1
L12	Ant. Shunt Coil	0Ω		M100454				Note 1
L13	Ant. Shunt Coil	0Ω		M100454				Note 1
L14	IF Trap	0Ω		M100454				Note 1
L15	FM Trap	0Ω		M100454				Note 1
L16	RF Choke	0Ω		M100697				Note 2
L17	VHF Ant. Coil	0Ω		M100689				Channel 2-Note 2
L18	VHF Ant. Coil	0Ω		M100689				Channel 3-Note 2
L19	VHF Ant. Coil	0Ω		M100692				Channel 4-Note 2
L20	VHF Ant. Coil	0Ω		M100691				Channel 5-Note 2
L21	VHF Ant. Coil	0Ω		M73481				Channel 6-Note 2
L22	VHF Ant. Coil	0Ω		M71469				Channel 6-Note 2
L23	VHF Ant. Coil	0Ω		M100690				Channel 9-Note 2
L24	VHF Ant. Coil	0Ω		M71469				Channel 10-Note 2
L25	VHF Ant. Coil	0Ω		M73552				Channel 11 -Note 2
L26	VHF Ant. Coil	0Ω		M79727				Channel 12-Note 2
L27	VHF Neut.Coil	0Ω		M100681				Channel 13-Note 3
L28	VHF Neut.Coil	0Ω		M100683				Channel 2-Note 3
R29	VHF Neut.Coil	0Ω		M100684				Channel 3-Note 3
L30	VHF NeutCoil	0Ω		M100685				Channel 4-Note 3
L31	VHF Neut. Coil	0Ω		M100686				Channel 5-Note 3
L32	VHF Neut. Coil	0Ω		M100678				Channel 6-Note 3
L33	VHF Neut. Coil	0Ω		M100687				Channel 7-8-Note 3
L34	VHF Neut. Coil	0Ω		M100687				Channel 9-10-Note 3
L35	VHF Neut. Coil	0Ω		M100687				Channel 11-13-Note 3
L36	RF Choke	0Ω		M100679				Note 4
L37	UHF IF Coil	.1Ω	.1Ω	M100677				Note 4
L38	UHF IF Coil	0Ω		M100675				Note 5
L39	VHF RF Coil	0Ω		M79717A				Channel 2-Note 5
L40	VHF RF Coil	0Ω		M79727				Channel 3-Note 5
L41	VHF RF Coil	0Ω		M79727				Channel 4-Note 5
L42	VHF RF Coil	0Ω		M79732				Channel 5-Note 5
L43	VHF RF Coil	0Ω		M73460				Channel 6-Note 5
L44	VHF RF Coils	0Ω		M100694				Channels 7 thru 13-Note 5
L45	VHF RF Coil	0Ω		M100683				Channel 13-Note 5
L46	UHF IF Coil	0Ω		M100676				Note 6
L47	VHF Mixer Grid Coil	0Ω		M79727				Channel 2-Note 6
L48	VHF Mixer Grid Coil	0Ω		M71469				Channel 3-Note 6
L49	VHF Mixer Grid Coil	0Ω		M71469				Channel 4-Note 6
L50	VHF Mixer Grid Coil	0Ω		M100686				Channel 5-Note 6
L51	VHF Mixer Grid Coil	0Ω		M73674				Channel 6-Note 6
L52	VHF Mixer Grid Coil	0Ω		M100695				Channels 7 thru 13-Note 6
L53	VHF Mixer Grid Coil	0Ω		M100680				Channel 13-Note 6
L54	IF Trap	0Ω						
L55	FIL Choke	0Ω		M76763				

MAGNAVOX CHASSIS CMUD477AA

AMPLIFIER CHASSIS PARTS LIST AND DISCRIPTION

TUBES (GENERAL ELECTRIC, SYLVANIA)

ITEM No.	USE	TYPE	NOTES
V27	AF Amp.-Phase Inverter	12AX7	
V28	Audio Output	6V6GT	
V29	Audio Output	6V6GT	
V30	LV Rectifier	5Y3GT	

PROPERTY OF
L. F. BLANKENSHIP
3924 MEADE ST
DENVER, COLORADO

ELECTROLYTIC CAPACITORS

ITEM No.	RATING CAP.	RATING VOLT.	REPLACEMENT DATA MAGNAVOX PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SANGAMO PART No.	SPRAGUE PART No.
C174A	▬40	450		AFH4-84	D064	FP429	TM-4022	Q-380	TVL-4734
B	■30	450							
C	▲10	450							
D	20	25							

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING CAP.	RATING VOLT	REPLACEMENT DATA MAGNAVOX PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	NOTES
C175	47			SI47	D6-470		GP1K-470	UC-5447	5GA-Q47	
C176	.1	200		P288N-1	DF-104	CUB2P1		PT401	2TM-P1	
C177	470			SI470	D6-471		GP2K-471	UC-5347	5GA-T47	
C178	5000			BPD-005	DD-502	K080	811-005	DC-525	5HK-D5	
C179	.047	600		BPD-05	DF-503	CUB6S47		PT6147	6TM-S47	
C180	.047	200		BPD-05	DF-503	CUB2S47		PT4147	2TM-S47	
C181	.022	200		BPD-02	DF-203	CUB4S22	817-02	PT4122	2TM-S22	
C182	1.0	100		P288N-1.0		ST4W1		PT41	2TM-M1	Note 6
C183	1.0	100		P288N-1.0		ST4W1		PT41	2TM-M1	Note 6
C184	1.0	100		P288N-1.0		ST4W1		PT41	2TM-M1	Note 6
C185	1.0	100		P288N-1.0		ST4W1		PT41	2TM-M1	Note 6

Note 6. When C182 and C184 are 2MFD unit, C183 and C185 are not used.

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING OHMS	RATING WATT	REPLACEMENT DATA MAGNAVOX PART No.	REPLACEMENT DATA IRC PART No.	NOTES
R233	68KΩ			BTS-68K	
R234	470KΩ			BTS-470K	
R235	100KΩ			BTS-100K	
R236	270KΩ			BTS-270K	
R237	3300Ω			BTS-3300	
R238	8.2Meg			BTS-8.2Meg	
R239	47KΩ			BTS-47K	
R240	4700Ω			BTS-4700	

ITEM No.	RATING OHMS	RATING WATT	REPLACEMENT DATA MAGNAVOX PART No.	REPLACEMENT DATA IRC PART No.	NOTES
R241	47KΩ			BTS-47K	
R242	470KΩ			BTS-470K	
R243	470KΩ			BTS-470K	
R244	270Ω	2		BTB-270	
R245	100KΩ			BTS-100K	
R246	10KΩ			BTS-10K	
R247	1000Ω			BTS-1000	
R248	470Ω	2		BTB-470	

TRANSFORMER (POWER)

ITEM No.	RATING PRI.	RATING SEC. 1	RATING SEC. 2	RATING SEC. 3	REPLACEMENT DATA MAGNAVOX PART No.	Halldorson PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.
T16	117VAC @ .50A	600VCT @ .076 ADC	5VAC @ 2A	6.3VAC @ 1.8A	C300078G2	P9305 ①			24R04 ①	R-9B ①

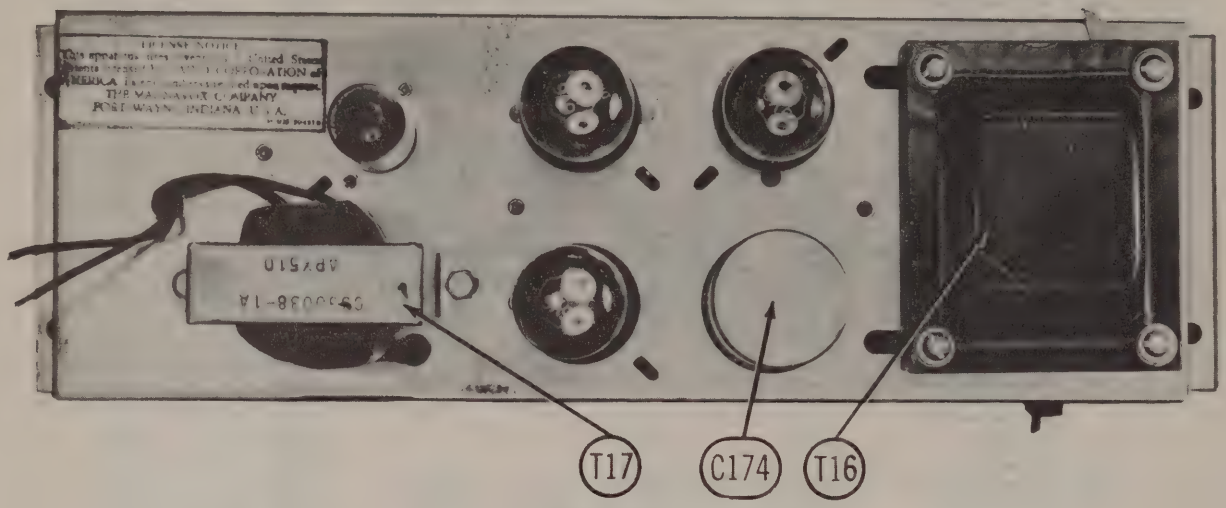
① Tape 6.3V center tap.

TRANSFORMER (AUDIO OUTPUT)

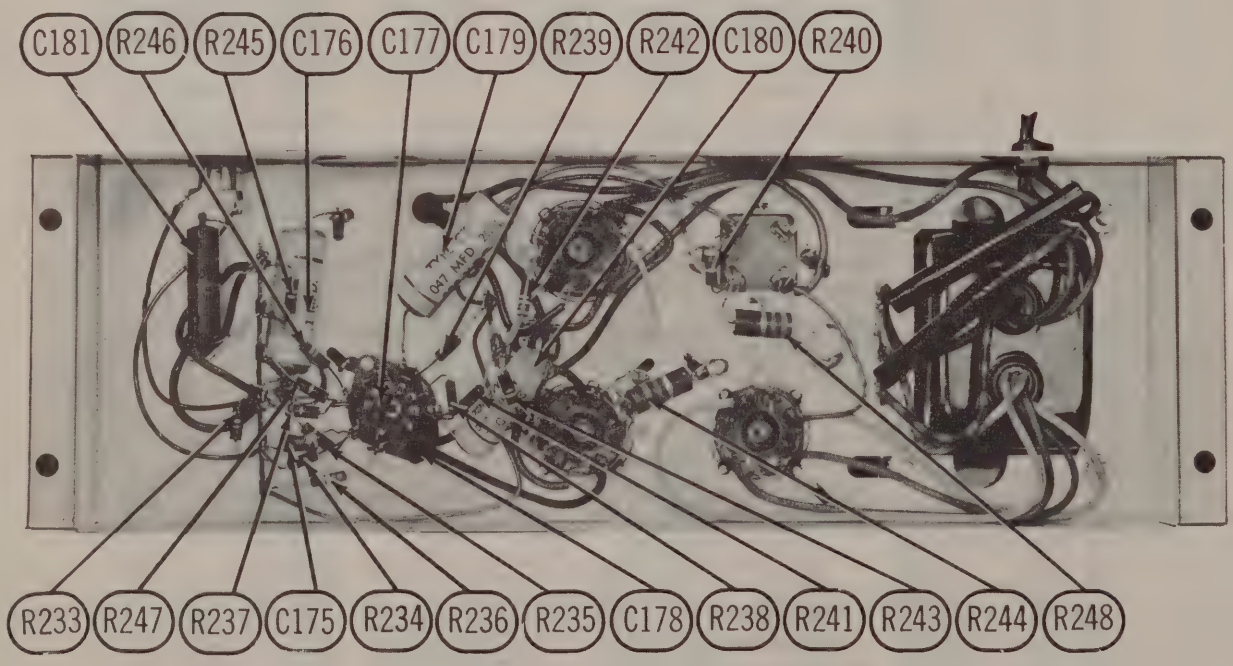
ITEM No.	IMPEDANCE PRI.	IMPEDANCE SEC.	REPLACEMENT DATA MAGNAVOX PART No.	Halldorson PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	NOTES
T17	5.9KΩ CT	2.6Ω	C330038-1A	Z1011	A-2935	A-3870	22S58	S-55X	① Drill one new mtg. hole.

SPEAKER

ITEM No.	RATINGS SIZE	RATINGS FIELD	RATINGS V. C. IMP.	REPLACEMENT DATA MAGNAVOX PART No.	QUAM PART No.	RCA TYPE No.	NOTES
SP1	10"	PM	5.2Ω	583733	10A10X		
SP2	10"	PM	5.2Ω	583734	10A10X		
SP3	5"	PM	3.4Ω	580038-1	5A15TZ3.2		
SP4	5"	PM	3.4Ω	580038-1	5A15TZ3.2		



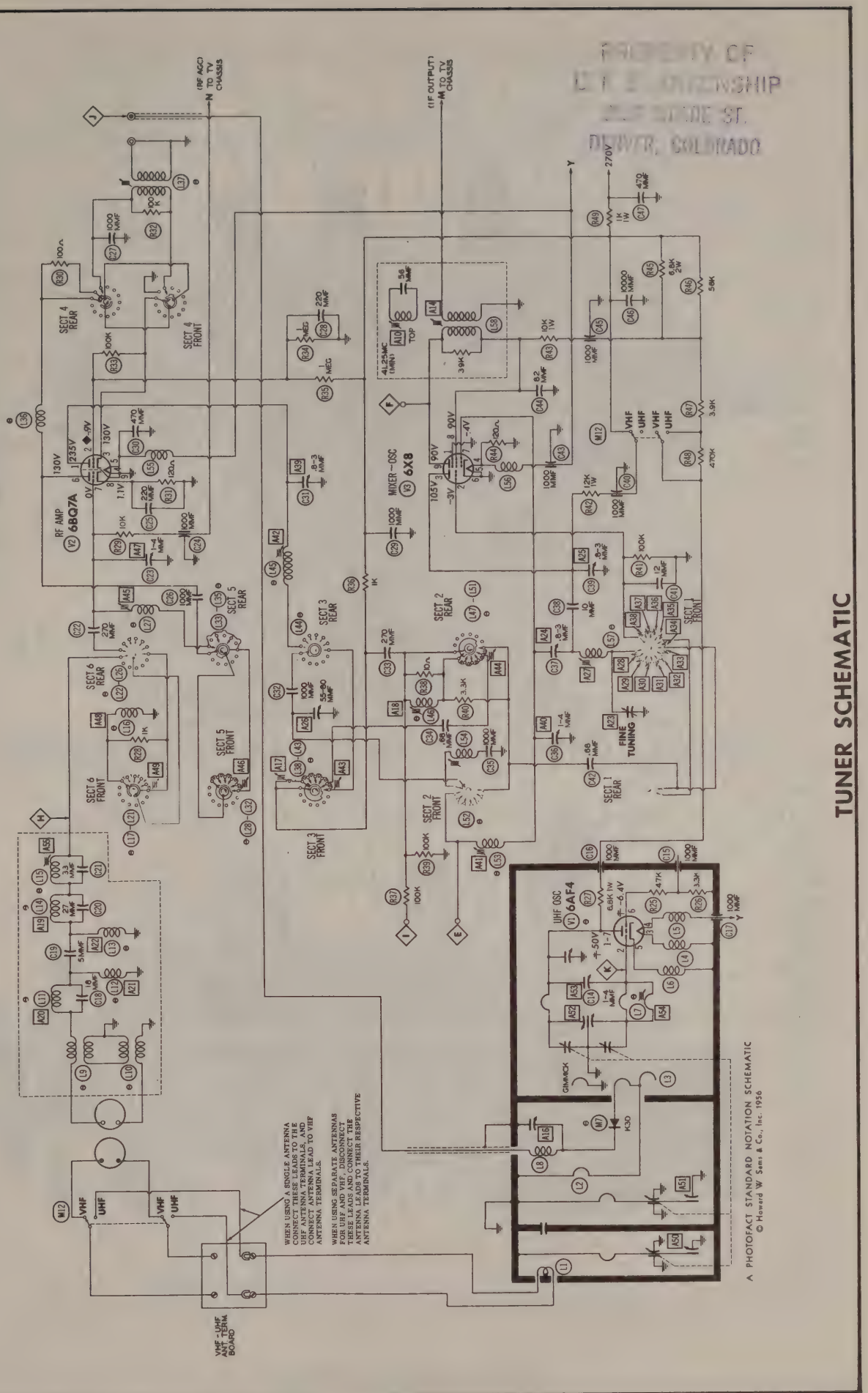
AMPLIFIER CHASSIS TOP VIEW



AMPLIFIER CHASSIS BOTTOM VIEW

SET 323 FOLDER 8

PROPERTY OF
C.T.E. APPRENTICESHIP
2545 STEELE ST.
DENVER, COLORADO


(RF AGC TO TV CHASSIS)
(IF OUTPUT) TO TV CHASSIS
RF AMP 6BQ7A
MIXER – OSC 6X8
UHF OSC 6AF4
SECT 1 REAR
SECT 2 REAR
SECT 2 FRONT
SECT 3 REAR
SECT 3 FRONT
SECT 4 REAR
SECT 4 FRONT
SECT 5 REAR
SECT 5 FRONT
SECT 6 REAR
SECT 6 FRONT
FINE TUNING
VHF
UHF
VHF - UHF ANT. TERM. BOARD
WHEN USING A SINGLE ANTENNA CONNECT THAT ANTENNA LEAD TO UHF ANTENNA TERMINALS, AND CONNECT ANTENNA LEAD TO VHF ANTENNA TERMINALS.
WHEN USING SEPARATE ANTENNAS FOR UHF AND VHF, DISCONNECT THESE LEADS AND CONNECT THE ANTENNA LEADS TO THEIR RESPECTIVE ANTENNA TERMINALS.
A PHOTOFACT STANDARD NOTATION SCHEMATIC
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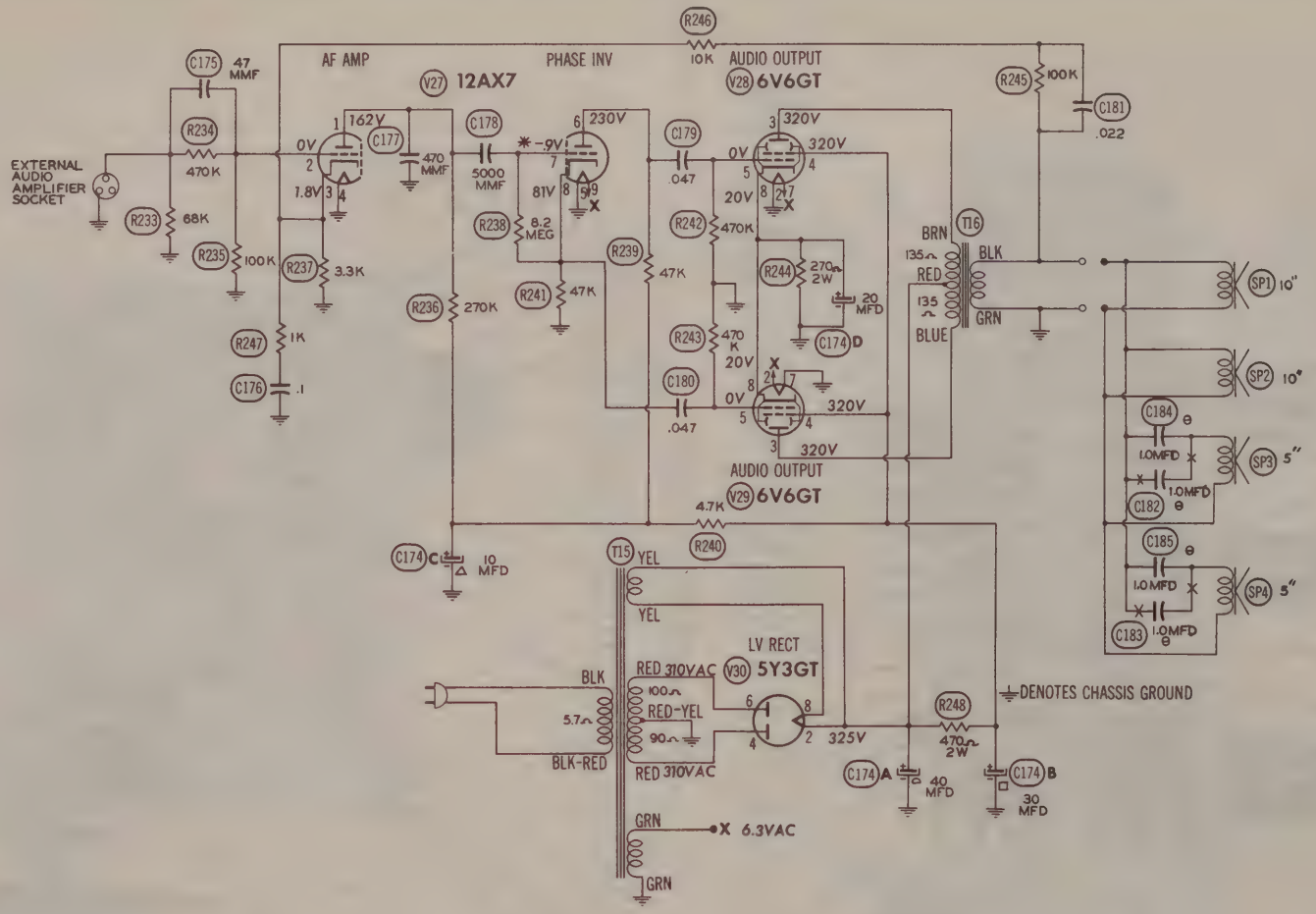
TUNER SCHEMATIC

AMPLIFIER SCHEMATIC

SET 323 FOLDER 8



RESISTANCE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V27	12AX7	† 275KΩ	100KΩ	3.3KΩ	0Ω	0Ω	† 52KΩ	8.2Meg	47KΩ	.1Ω
V28	6V6GT	NC	0Ω	† 135Ω	† 470Ω	470KΩ	NC	.1Ω	270Ω	
V29	6V6GT	NC	.1Ω	† 135Ω	† 470Ω	470KΩ	NC	0Ω	270Ω	
V30	5Y3GT	NC	100KΩ	NC	100Ω	NC	100Ω	NC	100KΩ	

† MEASURED FROM PIN 2 OF V30.
NC-NO CONNECTION.
* MEASURED FROM PIN 8 OF V27.
Θ SEE PARTS LIST FOR ALTERNATE VALUE OR APPLICATION.

A PHOTOFACT STANDARD NOTATION SCHEMATIC
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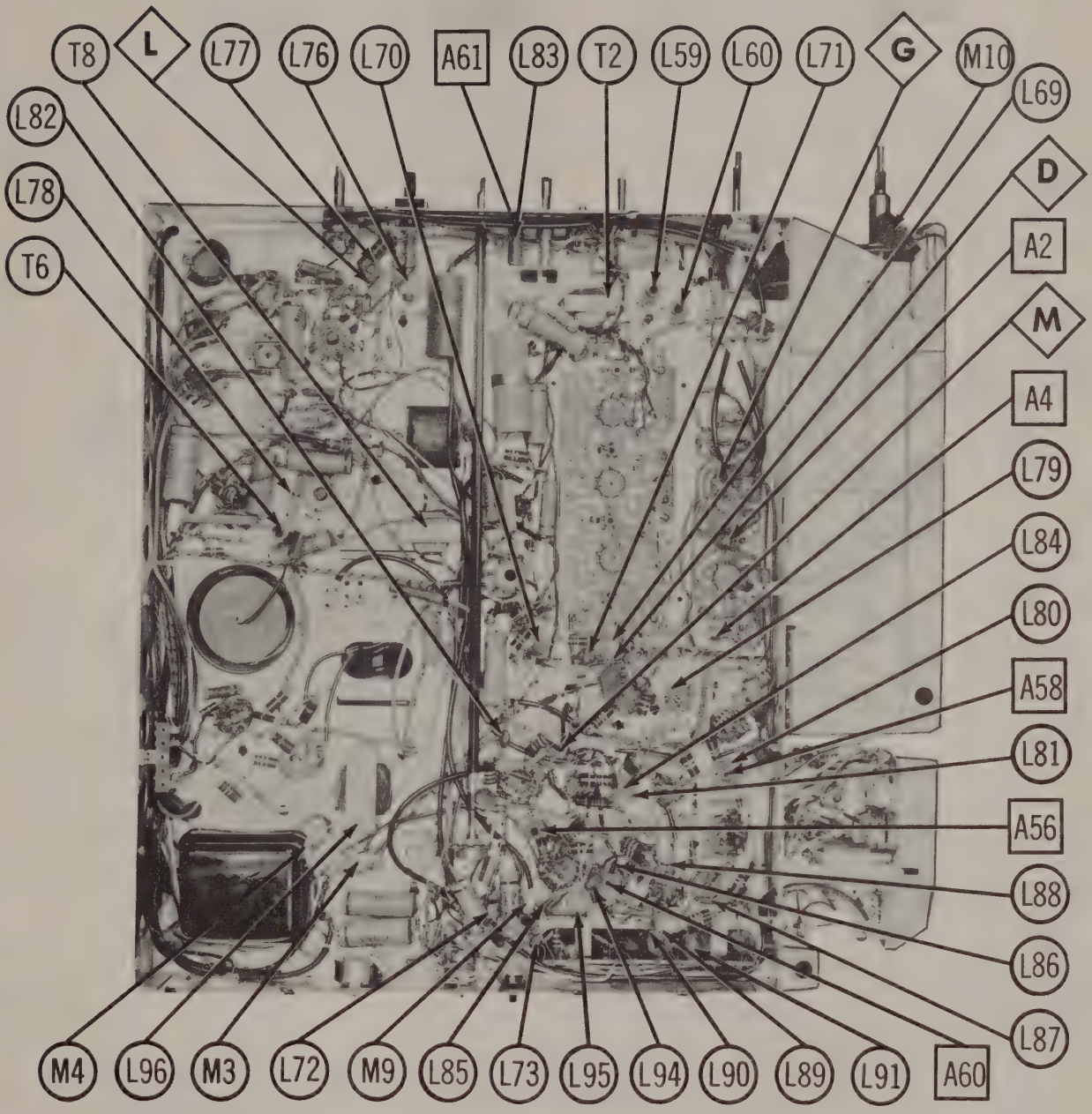
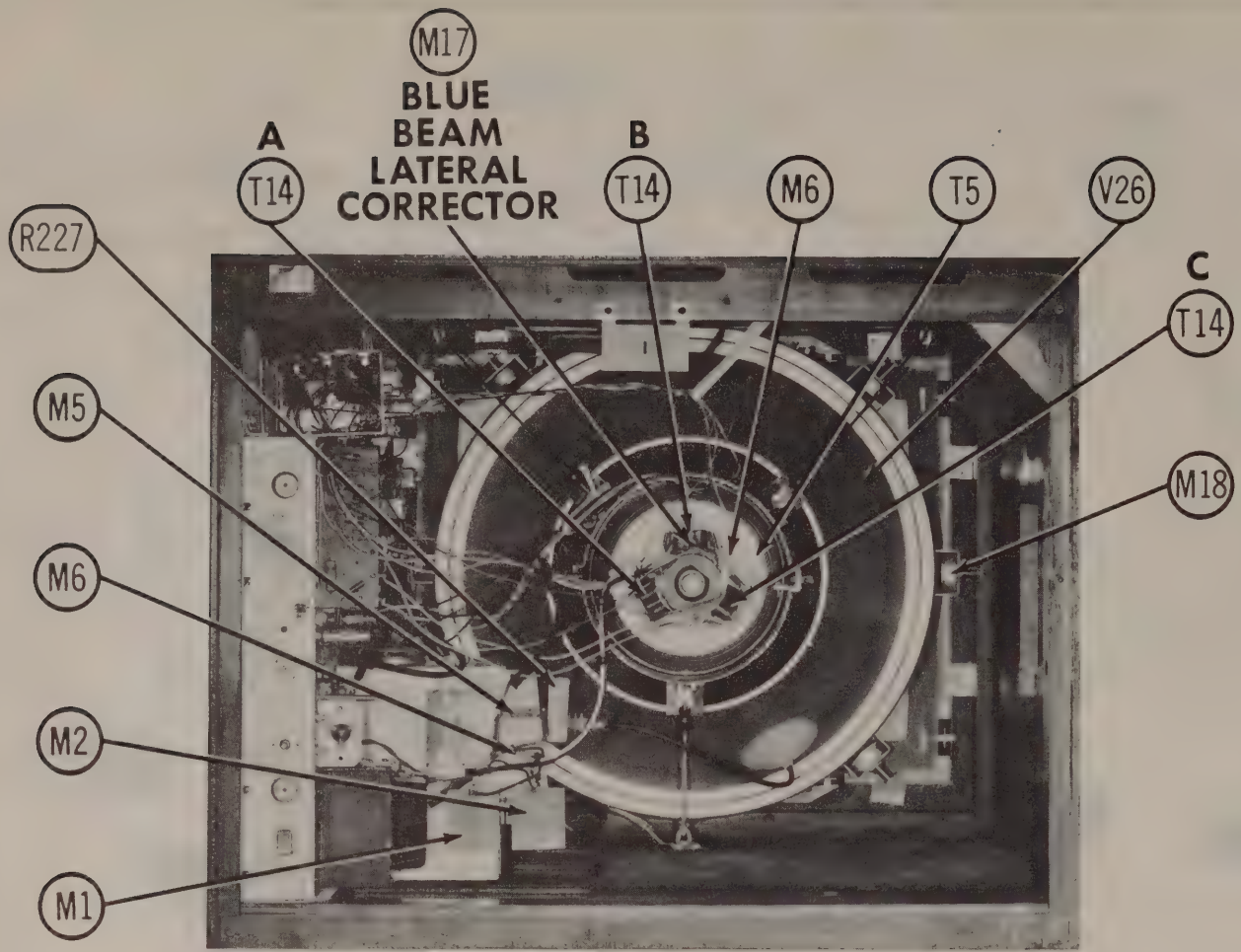


CHASSIS BOTTOM VIEW-TRANS., INDUCTOR AND ALIGNMENT IDENTIFICATION



CABINET—REAR VIEW

DISASSEMBLY INSTRUCTIONS

CHASSIS REMOVAL

1. Remove 7 push-on type control knobs and UHF dial from front panel of cabinet.
2. Remove 8 wood screws and 2 metal screws. Remove rear cover.
3. Remove the cabinet top by taking the 3 bolts holding top in place; slide top to the rear 1 inch and lift off.
4. Disconnect H. V. lead, picture tube socket ; remove the yoke plug, speaker leads and the convergence yoke plug.
5. Loosen 2 wood screws. Remove antenna terminal bracket.
6. Remove 5 chassis bolts. Remove chassis.
7. Remove 8 speaker nuts. Remove 2 speakers.

PICTURE TUBE REMOVAL

1. Remove chassis as under chassis removal.
2. Lay cabinet face down on a soft surface.
3. Remove the blue beam positioning magnet and the purifying magnet assembly by sliding them from the neck of the picture tube.
4. Slide the convergence yoke assembly from the neck of the picture tube.
5. Loosen the (3) retaining rod thumb screws and disengage the rods from the retaining ring. Slide the retaining ring and yoke assembly from the neck of picture tube.
6. Unclip the ground lead to the front mask trim and loosen the screw holding the field equalizing magnet assembly Carefully slide assembly off from the front end of the picture tube insulator and remove.
7. Remove insulating shield and anode connector. Grasp the picture tube at the rear flange, and lift straight up and out of cabinet. Place picture tube face down on a soft pad ,then remove rubber ring cushion from around the front flange of the picture tube.

NOTE: Use extreme caution when removing the picture tube.

PROPERTY OF
L. F. BLANKENSHIP
3124 MEADE ST.
DENVER, COLORADO

MASCO
MODELS AMF, AMP

MASCO
MODELS AMF, AMP

TRADE NAME	Masco Models AMF, AMP
MANUFACTURER	Mark Simpson Mfg. Co., Inc., 32-28 49th. St., Long Island City 3, N.Y.
TYPE SET	AC-DC Operated AM Superheterodyne Receiver With Remote Speaker Provisions
TUBES (Five)	Types 12BE6 Converter, 12BA6 IF Amplifier, 12AV6 Det.-AVC-AF Amp., 50L6GT Output, 35W4 Rectifier
POWER SUPPLY	110-120 Volts AC-DC — RATING .24 Amp. @ 117 Volts AC
TUNING RANGE—BROADCAST	530KC-1620KC

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

To set pointer, turn tuning capacitor fully closed and set pointer to last reference mark at low frequency end of dial.
Use isolation transformer, if available. If not, connect a .1MFD capacitor in series with low side of signal generator and B-.
Loop should be maintained in same relative position to chassis as when receiver is in cabinet.
Volume control should be at maximum position. Output of signal generator should be no higher than necessary to obtain an output reading. Use an insulated alignment screwdriver for adjusting.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
1.	.01MFD	High side to pin 7 (grid) of 12BE6 (V1). Low side to chassis.	455KC (400%Mod)	Tuning gang fully open	Across voice coil	A1, A2, A3, A4	Adjust for maximum output. If isolation transformer is not used, reduce dummy antenna to .001MFD to reduce hum modulation.
2.	"	"	1620KC	"	"	A5	"
3.		Loop	1400KC	Tune to 1400KC signal	"	A6	Fashion loop of several turns of wire and radiate signal into loop of receiver. Adjust for maximum output.
4.		"	600KC	Tune to 600KC signal	"	A7	Adjust for maximum output while rocking tuning gang.

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PARTS LIST AND DESCRIPTIONS

MASCO
Model AMF

TUBES (GENERAL ELECTRIC, SYLVANIA)

ITEM No.	USE	TYPE	NOTES
V1	Converter	12BE6	
V2	IF Amplifier	12BA6	
V3	Det.-AVC-AF Amp.	12AV6	
V4	Output	50L6GT	
V5	Rectifier	35W4	

ELECTROLYTIC CAPACITORS

ITEM No.	RATING CAP.	RATING VOLT.	REPLACEMENT DATA MASCO PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SANGAMO PART No.	SPRAGUE PART No.
C1A	50	150		PRS150V3050	BBRD5315	TCD497	TDL-5030-150	FMD-301	TVA-2450
B	30	150							

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING CAP.	RATING VOLT	REPLACEMENT DATA MASCO PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	NOTES
C2	.05	400		BPD-05	DF-503	CUB4S5		PT415	4TM-S5	
C3A	220									
B	2000									
C	5000			♦PA-113-1	♦PC-150	♦116TM1	♦1408-01		♦DT-1	
D	250									
E										
C4	.01	600		BPD-01	D6-103	CUB6S1	GP3-333-103	PT611	6TM-S1	
C5	.047	400		BPD-05	DF-503	CUB4S47		PT4147	4TM-S5	
C6	.05	400		BPD-05	DF-503	CUB4S47		PT4147	4TM-S5	

♦ Items C3A, C3B, C3C, C3D, C3E, R5A, R5B and R5C are combined in one unit. When replacing items separately, C3D and C3E should total 250MMF.

CONTROLS

ITEM No.	RATING RESISTANCE	RATING WATTS	REPLACEMENT DATA MASCO PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	IRC PART No.	MALLORY PART No.	INSTALLATION NOTES
R1A	500KΩ	½		AB-60	A47-500K-Z	Q13-133	U-48	Volume
B	Shaft			AK-4	KSS-3	Not Req.	Not Req.	Attach to R1A
C	Switch			KB-1	SWE-12	76-1	US-26	Attach to R1A

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

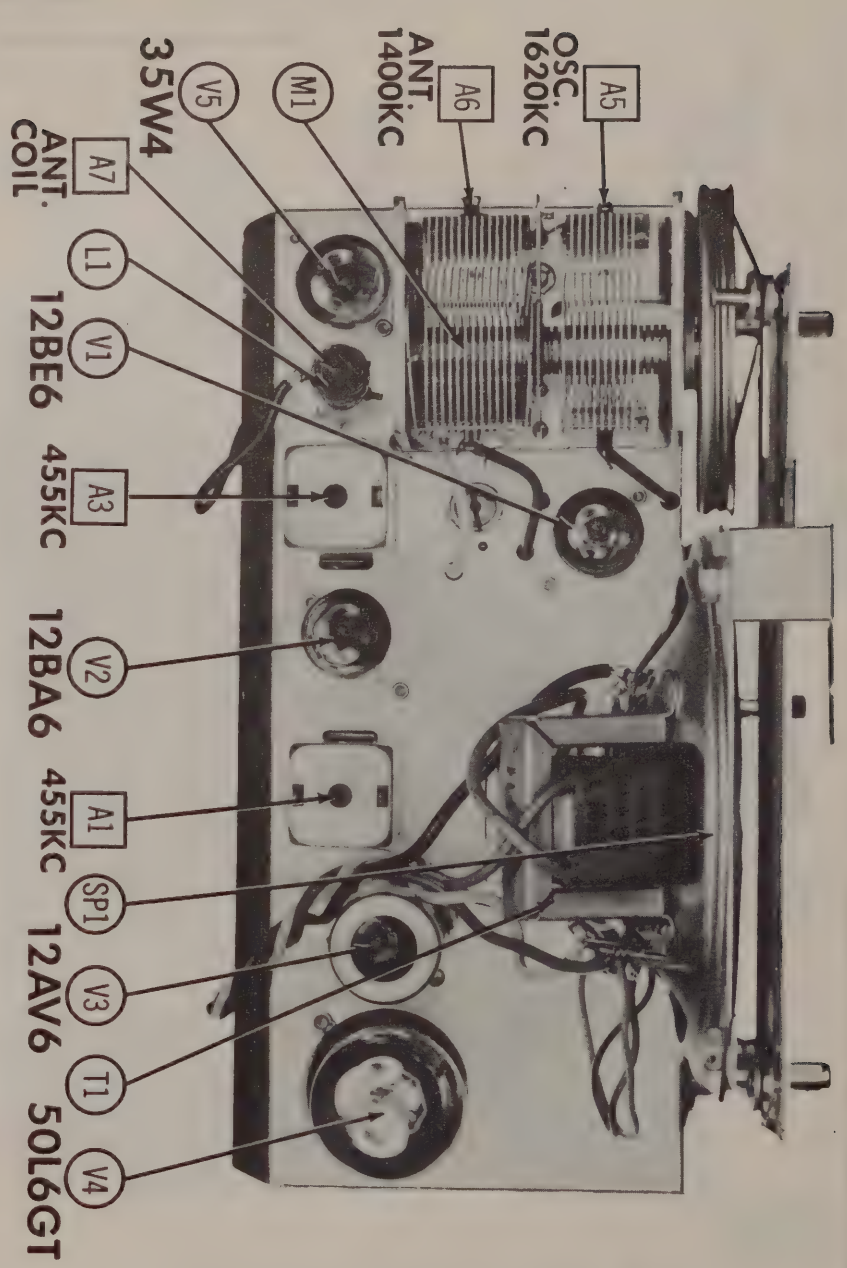
ITEM No.	RATING OHMS	RATING WATT	REPLACEMENT DATA MASCO PART No.	IRC PART No.	NOTES
R2	22KΩ			BTS-22K	
R3	180Ω			BTS-180	
R4	3.3Meg			BTS-3.3Meg	
R5A	6.8Meg			BTS-6.8Meg	
B	470KΩ		♦	BTS-470K	
C	470KΩ			BTS-470K	
R6	150Ω			BTS-150	
R7	1500Ω	1		BTA-1500	
R8	22Ω			BTS-22	

♦ Items R5A, R5B, R5C, C3A, C3C, C3D, C3E are combined in one unit.

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE PRI.	IMPEDANCE SEC.	REPLACEMENT DATA MASCO PART No.	Halldorson PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	NOTES
T1	2.8KΩ	3-4Ω		Z1101	A-3025	A-3332	26S48	S-12X	

CHASSIS—TOP VIEW



PARTS LIST AND DESCRIPTIONS (Continued)

SPEAKER

ITEM No.	RATINGS			REPLACEMENT DATA			NOTES
	SIZE	FIELD	V. C. IMP.	MASCO PART No.	QUAM PART No.	RCA TYPE No.	
SP1	4"	PM	3-4Ω		4A07	223S1	

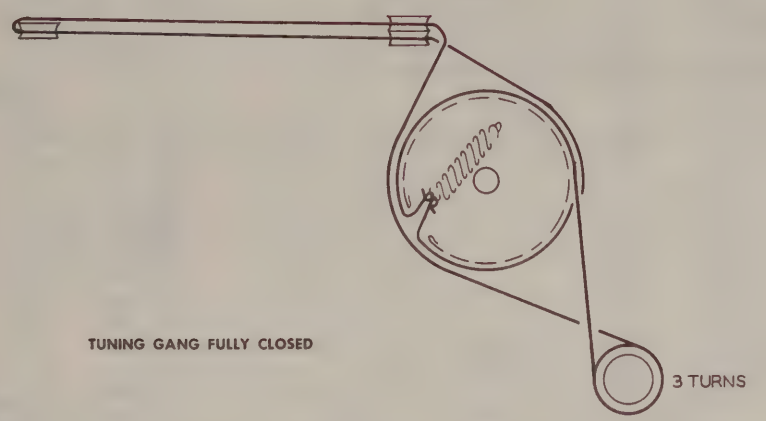
COILS (RF-IF)

ITEM No.	USE	DC RES.		REPLACEMENT DATA				NOTES
		PRI.	SEC.	MASCO PART No.	MEISSNER PART No.	MERIT PART No.	MILLER PART No.	
L1	Ant. Coil	0Ω	1.1Ω					
L2	Osc. Coil	.5Ω	5.3Ω		14-1073 *		69-OSC ■	
L3	Input IF	17Ω	17Ω	E622				
L4	Output IF	17Ω	17Ω	E622				

* Leads sufficient mounting support.
■ Drill new mounting hole.

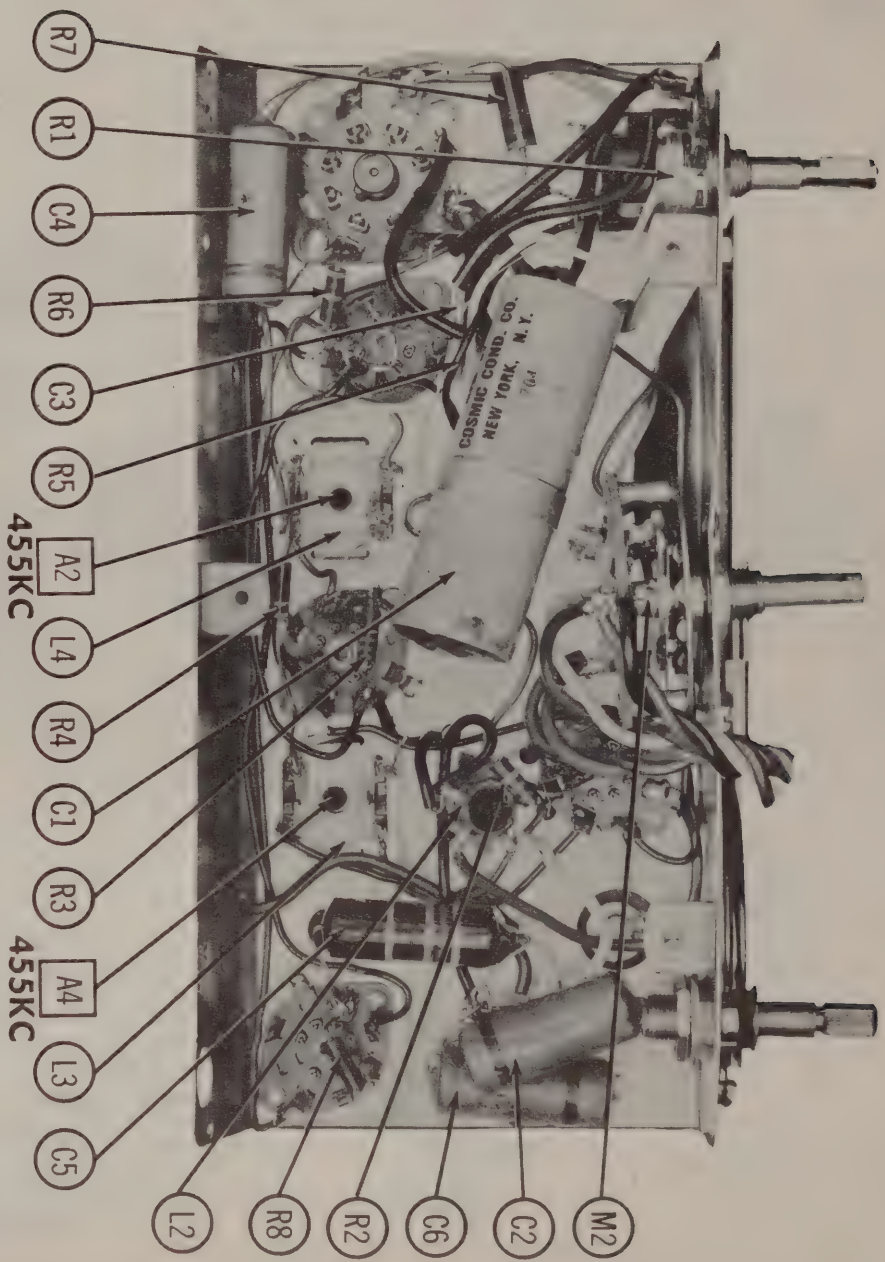
MISCELLANEOUS

ITEM No.	PART NAME	MASCO PART No.	NOTES
M1	Tuning Cap.	E353	2 Gang (15-425MMF, 18-180MMF)
M2	Switch		Radio-Broadcast (Rotary-wafer type)

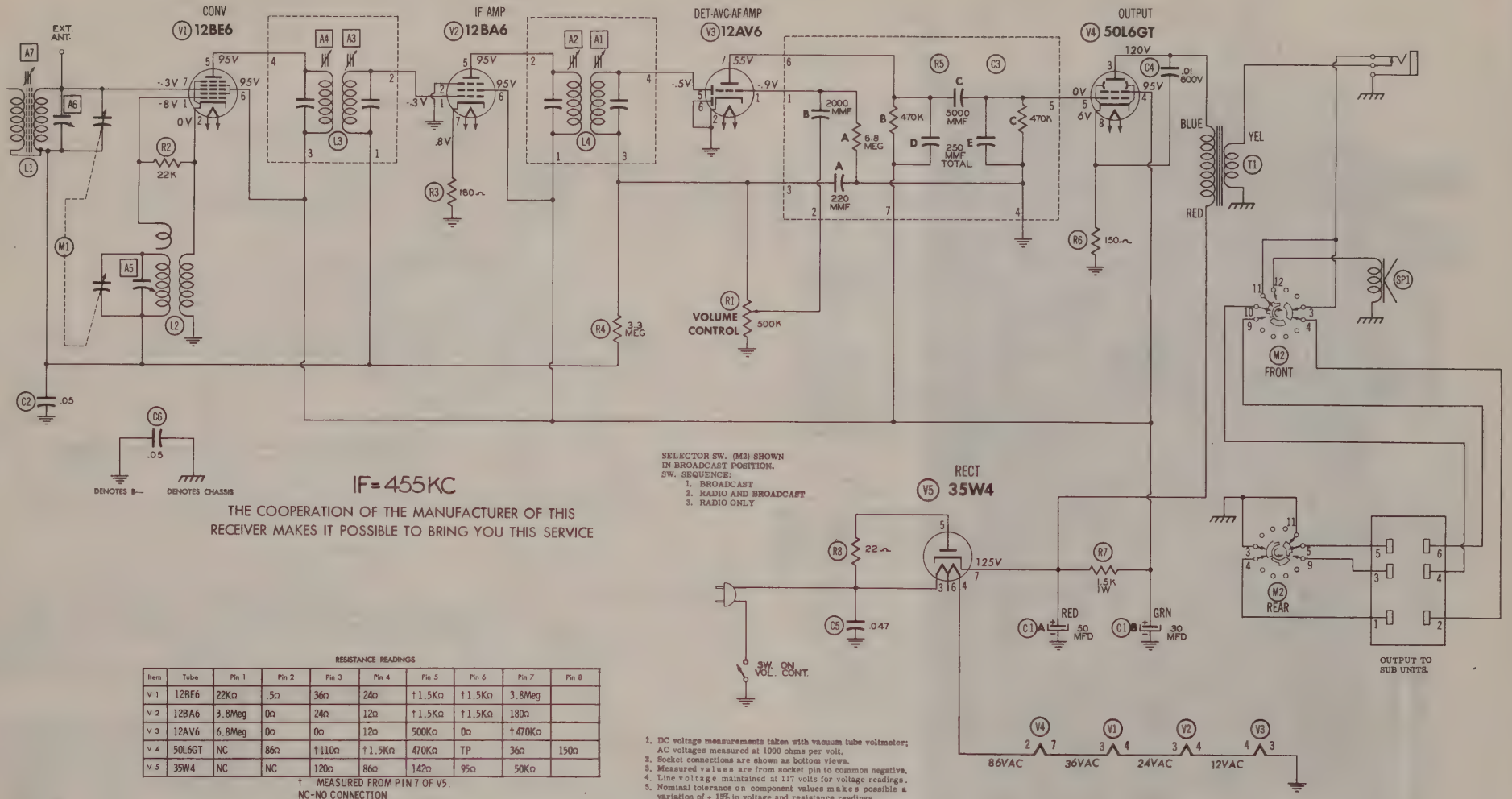


DIAL CORD STRINGING

CHASSIS—BOTTOM VIEW



MASCO Model AMF



IF=455KC

THE COOPERATION OF THE MANUFACTURER OF THIS RECEIVER MAKES IT POSSIBLE TO BRING YOU THIS SERVICE

SELECTOR SW. (M2) SHOWN IN BROADCAST POSITION.
SW. SEQUENCE:
1. BROADCAST
2. RADIO AND BROADCAST
3. RADIO ONLY

RESISTANCE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8
V 1	12BE6	22KΩ	.5Ω	36Ω	24Ω	†1.5KΩ	†1.5KΩ	3.8Meg	
V 2	12BA6	3.8Meg	0Ω	24Ω	12Ω	†1.5KΩ	†1.5KΩ	180Ω	
V 3	12AV6	6.8Meg	0Ω	0Ω	12Ω	500KΩ	0Ω	†470KΩ	
V 4	50L6GT	NC	86Ω	†110Ω	†1.5KΩ	470KΩ	TP	36Ω	150Ω
V 5	35W4	NC	NC	120Ω	86Ω	142Ω	95Ω	50KΩ	

† MEASURED FROM PIN 7 OF V5.
NC-NO CONNECTION
TP-TIE POINT

1. DC voltage measurements taken with vacuum tube voltmeter; AC voltages measured at 1000 ohms per volt.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance on component values makes possible a variation of ± 15% in voltage and resistance readings.
6. Volume control at maximum, no signal applied for voltage measurements.

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MITCHELL
MODEL 1425A

Figure 1

GENERAL INFORMATION

The Mitchell Model 1425A Tape Recorder is designed to record and play back two tracks of material on standard width (1/4") recording tape, which doubles the playing time of a reel of tape with no loss of frequency response or quality. Recordings can be made from a radio, television receiver or phonograph, in addition to those made directly from the microphone. Recordings can be played back through the self-contained speakers or an external speaker through use of the Output Jack. The Mitchell dual speed tape recorder is a self contained unit complete with microphone and a reel of tape.

Model 1425A is designed for two speed performance, one speed being 7 1/2" per second and the other at 3 3/4" per second. Using both channels of the tape, the recording time is as follows:

Reel Size	3 3/4" Speed	7 1/2" Speed
5" (600 ft.)	1 hour	1/2 hour
7" (1200 ft.)	2 hours	1 hour

This recorder is designed to operate on 60 cycle, 110-120 volts, AC supply only.

CAUTION: Severe Damage Will Result If Connection Is Made To A Direct Current (DC) Line.

Manufactured by:

Mitchell Mfg. Co.
2525 Clybourn
Chicago 14, Illinois

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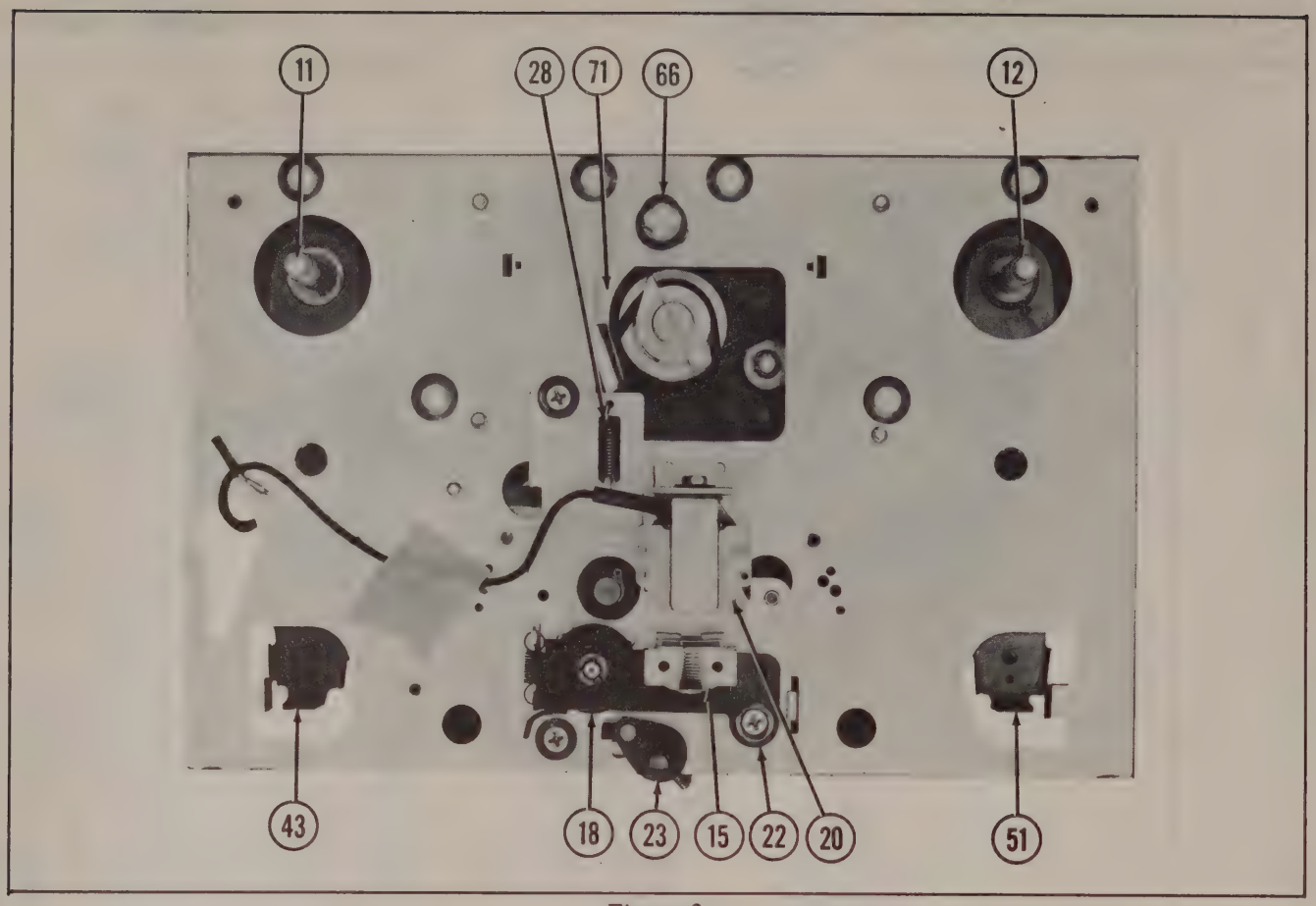

Figure 2

SPECIFICATIONS

Controls: On-Off Tone, Volume, Record-Playback, Fast Forward, Fast Rewind.

Tubes: 12AU7A AF Amp., 12AX7 AF Amp., 6V6GT Audio Output and Bias Osc., 6E5 Record Level Indicator, 6X5GT Rectifier.

Fast Speed: 5" reel - 45 seconds 7" reel - 90 seconds.

Freq. Response: 65 to 10,000 cycle per sec.

Power Requirements: 110-120 volts - 60 cycle AC only @ 70 watts.

Power Output: 2 watts.

OPERATING INSTRUCTIONS

1. With the On-Off Tone Control in the "Off" position, insert the AC cord into a convenient wall receptacle of the proper rating.

Threading The Tape-

1. Place a reel of tape on the right reel plate (7) and an empty reel on the left reel plate (2) making sure the reel slots engage the pins on the reel plates.

2. Unwind about 10" of tape from the reel. Hold a section of the tape straight with both hands and insert the tape in the tape reel slot making sure the dull coated side faces the rear of the recorder.

NOTE: This recorder uses Type "A" wound tape, i.e. the dull magnetic coated side faces inward on the reel. If the tape used is Type "B" (coated side facing outward) the recording will be made at a very low sound level and the playback will be almost inaudible.

3. Insert the free end of the tape into one of the three radial slots in the hub of the empty reel. Turn the reel several turns, clockwise, until the tape is secured to the reel and all slack is taken up between reels.

To Record From Microphone-

1. Turn the On-Off Tone Control clockwise until a click is heard and allow about thirty seconds for the tubes to warm up.

2. Insert the microphone plug into the "Mike" jack.

3. Depress the play-record control knob (4) as far as it will go, turn clockwise until it locks while holding it down.

4. Hold the microphone about six inches from your mouth and speak in a normal voice. Adjust the "Volume" control until the record level indicator tube almost closes for extremely loud passages only. The "V" should never completely close or fold over (overlap).

NOTE: Correct recording volume is very important. Too weak a signal, which does not cause the

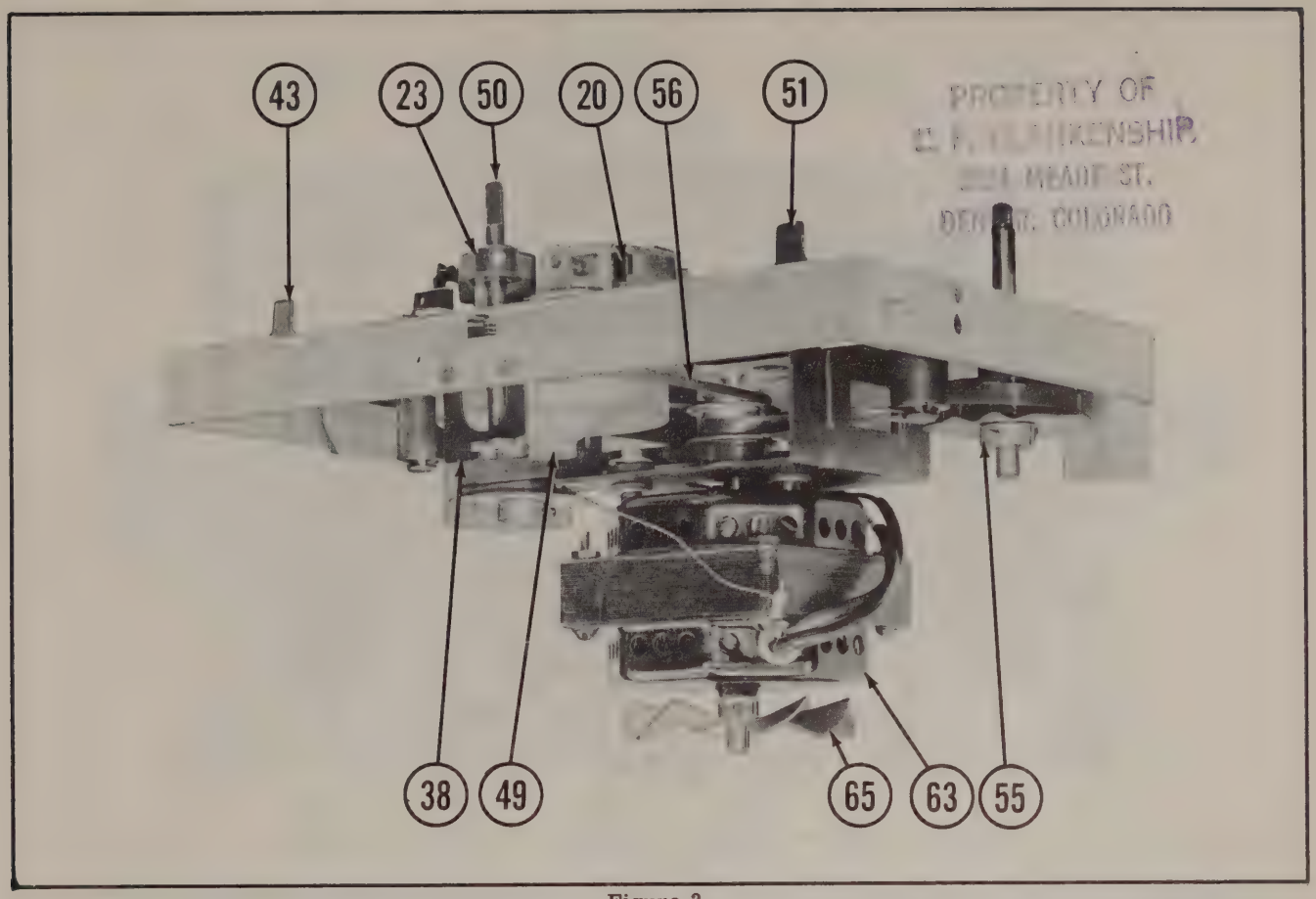

Figure 3

record level eye "V" to open and close continually, will result in weak playback and high background noise. Too strong a signal, causing the level indicator to close or fold over (overlap), will result in distortion during playback.

To Record From Radio-

Recordings from a radio may be made by one of three ways:

1. Place the microphone about 6" to 12" in front of the radio speaker. Turn the radio volume control to a normal level. Setting it too high will cause distortion. Turn the radio tone control to maximum treble. Set the recording level and proceed with recording as described under "To Record From Microphone". This type of recording may not be satisfactory as other sounds may be picked up by the microphone which as a result will be recorded on the tape.

2. Have a shielded cable made up with a two conductor phone plug on one end and two alligator clips on the other end. Connect the alligator clips across the voice coil terminals on the radio speaker and insert the cord plug into the "Radio - Phono" jack. Set the radio volume and tone controls as described above. Set recording level and proceed as described under "To Record From Microphone".

3. Have a shielded cable with a two conductor phone plug on one end and the other end connected across the radio volume control. Insert the phone plug into the "Radio-Phono" jack. Set the recording level and proceed with the recording as described under "To Record From Microphone". The position of the radio volume and tone controls has no effect on this set up and may be set anywhere.

To Record From Phonograph-

1. If the phonograph being used has a phone type plug on the pickup leads, insert it into the "Radio-Phono" jack. Set the recording level and proceed with the recording as described under "To Record From Microphone".

2. If the phonograph has a standard pin type plug which is more common, an adaptor and plug the adaptor into the "Radio-Phono" jack.

IMPORTANT: The recorder will not record from microphone or play back while a plug is inserted in the "Radio-Phono" jack.

To Record From Television Receiver-

1. Use one of the three methods described under "To Record From Radio" and proceed with the recording as described under "To Record From Microphone".

Dual Track Recording-

The Mitchell is designed so that only one-half the tape width is recorded at a time; thereby resulting in two track recording. This two track operation is accomplished in the following manner:

1. After a reel of tape has been recorded, i. e. all of the tape wound on to the take-up reel, turn the play-record control (4) to idle.

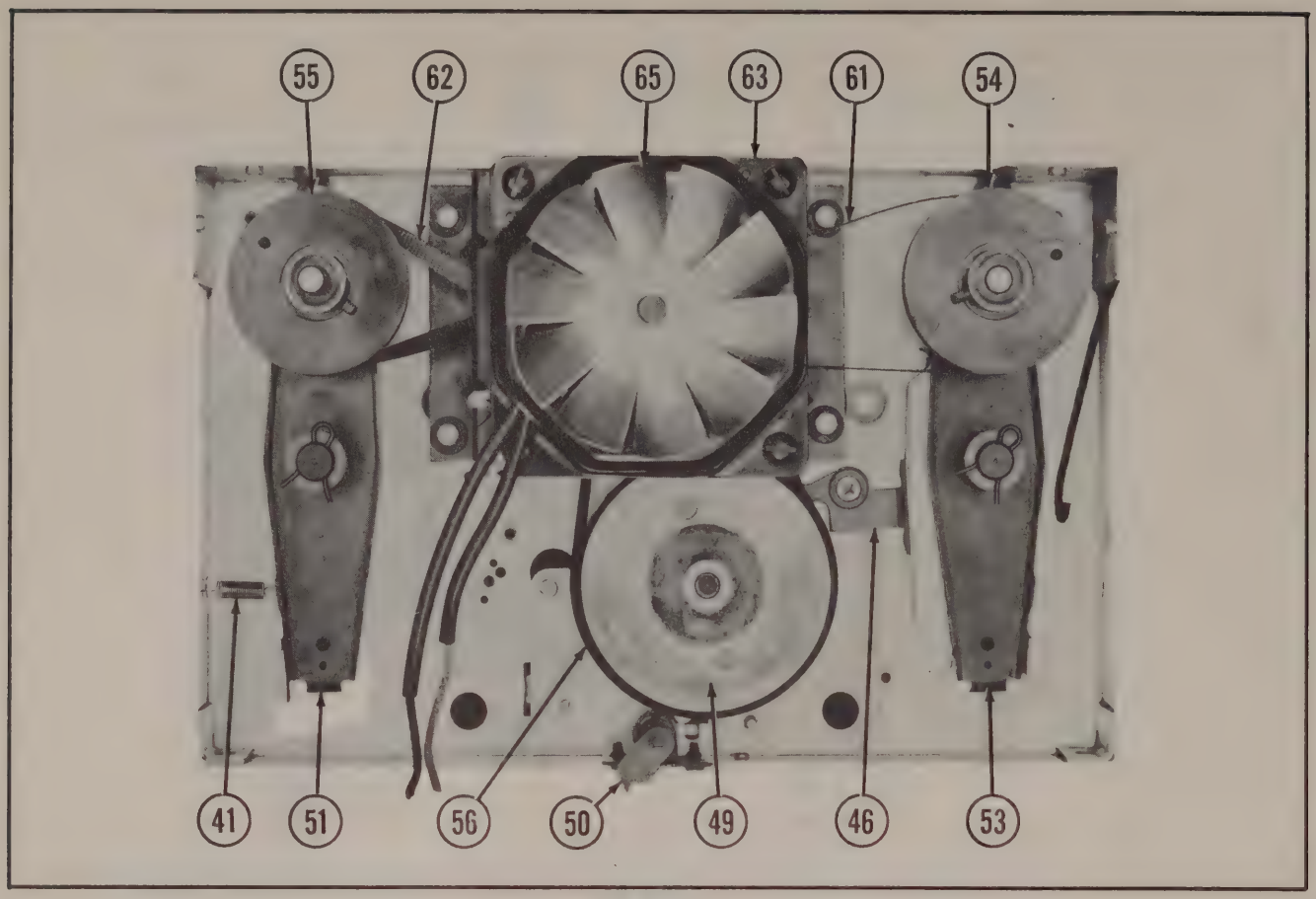

Figure 4

2. Remove the reels from the recorder, turning the full reel over and placing it on the right reel plate (7) and the empty reel on the left reel plate (2).

3. Properly thread the tape and proceed with recording.

4. After this track has been recorded the first track of recording is ready to be played without rewinding, by reversing the reels as described in step 2 above.

Fast Forward And Fast Rewind-

High - speed forward or reverse can be obtained by pressing the desired knob (9 or 10) toward the head cover. Movement of these controls will wind the tape on the desired reel at a high speed as long as the control is held in this position. These are used primarily in locating a desired portion of a recording in a few seconds.

CAUTION: Do not attempt "Fast Forward" or "Fast Rewind" with the play-record control (4) on anything but idle position, as damage to the unit or breaking of the tape may result.

Braking-

The Mitchell is equipped with a quick stop when in high speed, either direction. Move both "Fast Forward" and "Fast Rewind" controls toward the head cover and then release both at the same time. For example: when in fast forward speed, continue to hold control and with the other hand move "Fast Rewind" control toward head cover. When machine stops, release both controls at the same time. If a coasting stop is desired, release control in motion and tape will glide to a momentum stop.

To Play A Recording-

1. Thread tape as described under "Threading the Tape".

2. Turn play-record control (4) clockwise without depressing until it locks.

3. Adjust the "Volume" and "Tone" controls for desired listening level.

To Use An External Speaker-

1. You may want to use a larger one than the ones in the recorder. To do this you will need a three conductor phone plug connected as shown in sketch.

2. Plug this into the Output jack and play the recorder thru the external speaker. The internal speaker is cut off.

CAUTION: Do not connect three-conductor plug into Output jack without external speaker attached; as damage to the output tube, transformer, and "Tone Control" may result.

To Edit And Splice Tape-

NOTE: Since it is impossible to edit and splice one track without affecting the other, recordings which are to be edited should be limited to one track only.

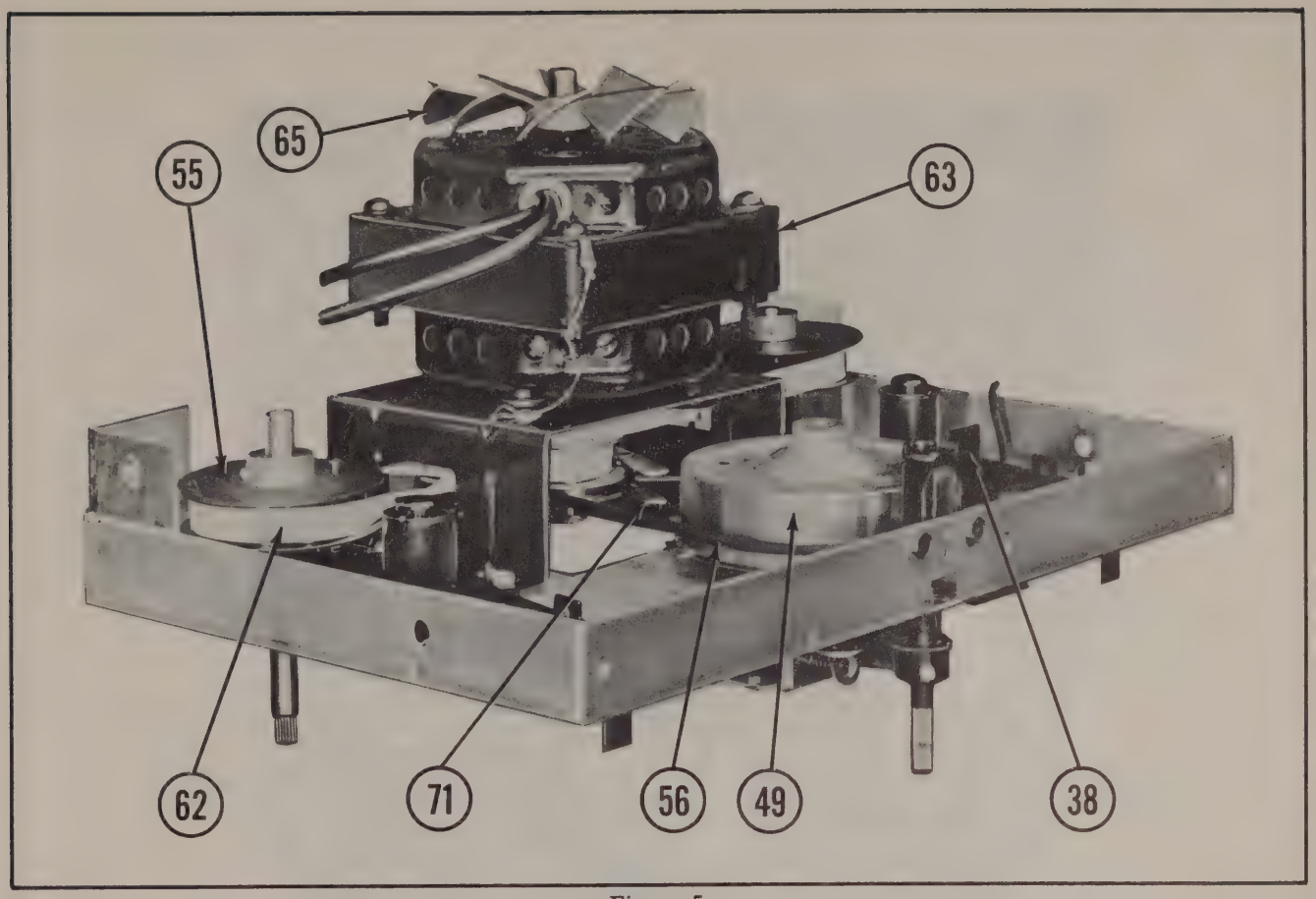

Figure 5

1. The tape may be edited by cutting out unwanted portions, or by joining selections into another sequence. Announcements may be inserted between selections, etc. Unused sections of tape can be spliced together for re-use.

2. For best results, cut tape at a slight diagonal, join ends together with splicing tape on the glossy side and trim off any excessive width.

Erasing Recorded Material-

In the record position any recording on the tape is automatically erased before a new recording is put on the tape. If it is desired to erase a recording without putting anything on the tape follow the normal recording procedure, but leave the "Volume" control set at its extreme counterwise position.

To Use As A Public Address System-

1. Insert the microphone plug into the "Radio-Phono" jack.

2. Leave the play-record control (4) in idle position.

3. Speak into the microphone and adjust the "Volume" and "Tone" controls for desired level.

4. Do not have the microphone too close to the speaker or a feedback howl will result.

ADJUSTMENTS

Remove Unit From Case-

All service except cleaning of the head and pressure roller and adjustment of the head and pressure pad assembly requires removal of the unit from the carrying case.

1. To remove unit from carrying case, disconnect power cord and remove the four Phillips head screws from bottom of case and carefully lift unit straight up and out.

Spindle (11 and 12) End Play Adjustments-

The spindle should have from 1/32" to 1/16" of up and down movement. Loosen the set screw in the pulley (54 or 55) and move the pulley up or down until the correct amount of end play is obtained.

Take Up Reel Seat (2) And Feed Reel Seat (7) Drag Adjustment-

When the play-record control (4) is released, the reels should stop right away to prevent looping of the tape. Also when in fast forward or rewind and the control is released the reels should coast to a stop without looping the tape. The stop arms on the motor-board (point "B" on exploded view) that the take up and feed reel arms (43 and 51) rest against when the tape is not moving are what govern this. The stop arms should be bent to force the take up reel arm (43) and the feed reel arm (51) over far enough to take up enough belt tension so that the spindles just start to revolve without the reels in place. The play-record control (4) should be in its extreme counterclockwise position when making this adjustment. With the reels in place the spindle should not revolve. If one or the other does, force the stop arm (point "B" on exploded view) over until it stops revolving.

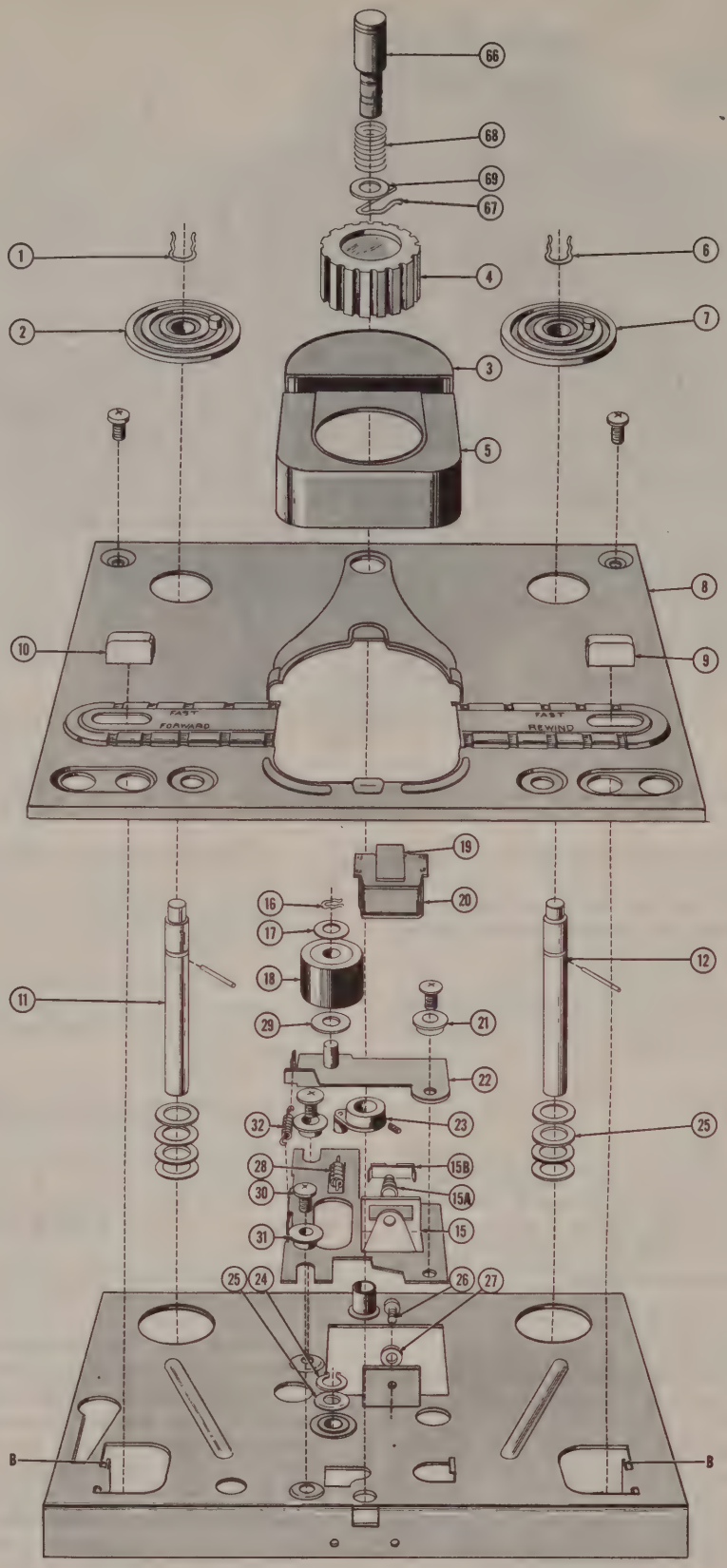

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Fig. 6A. Exploded View Of Parts Above Baseplate.

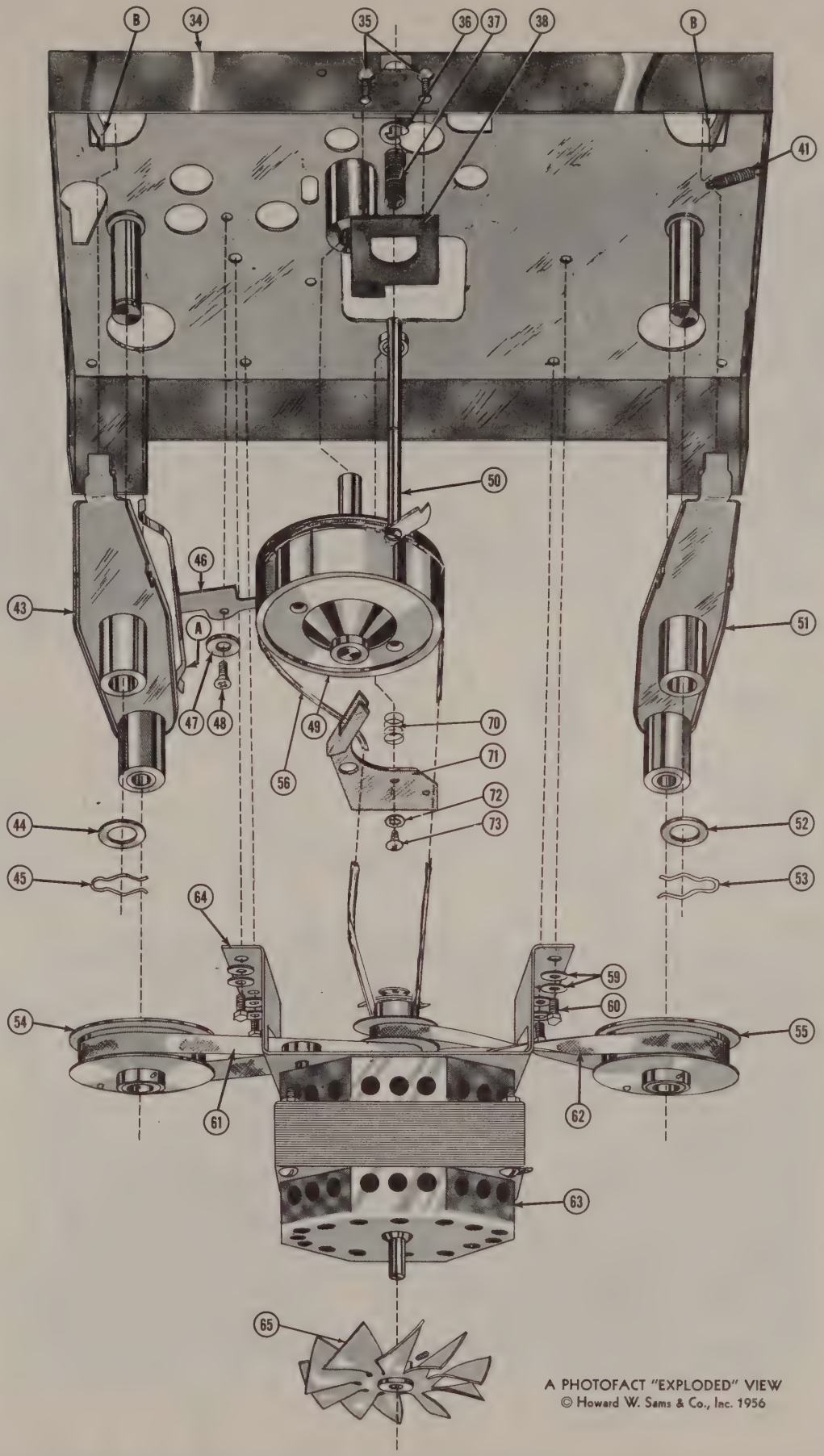
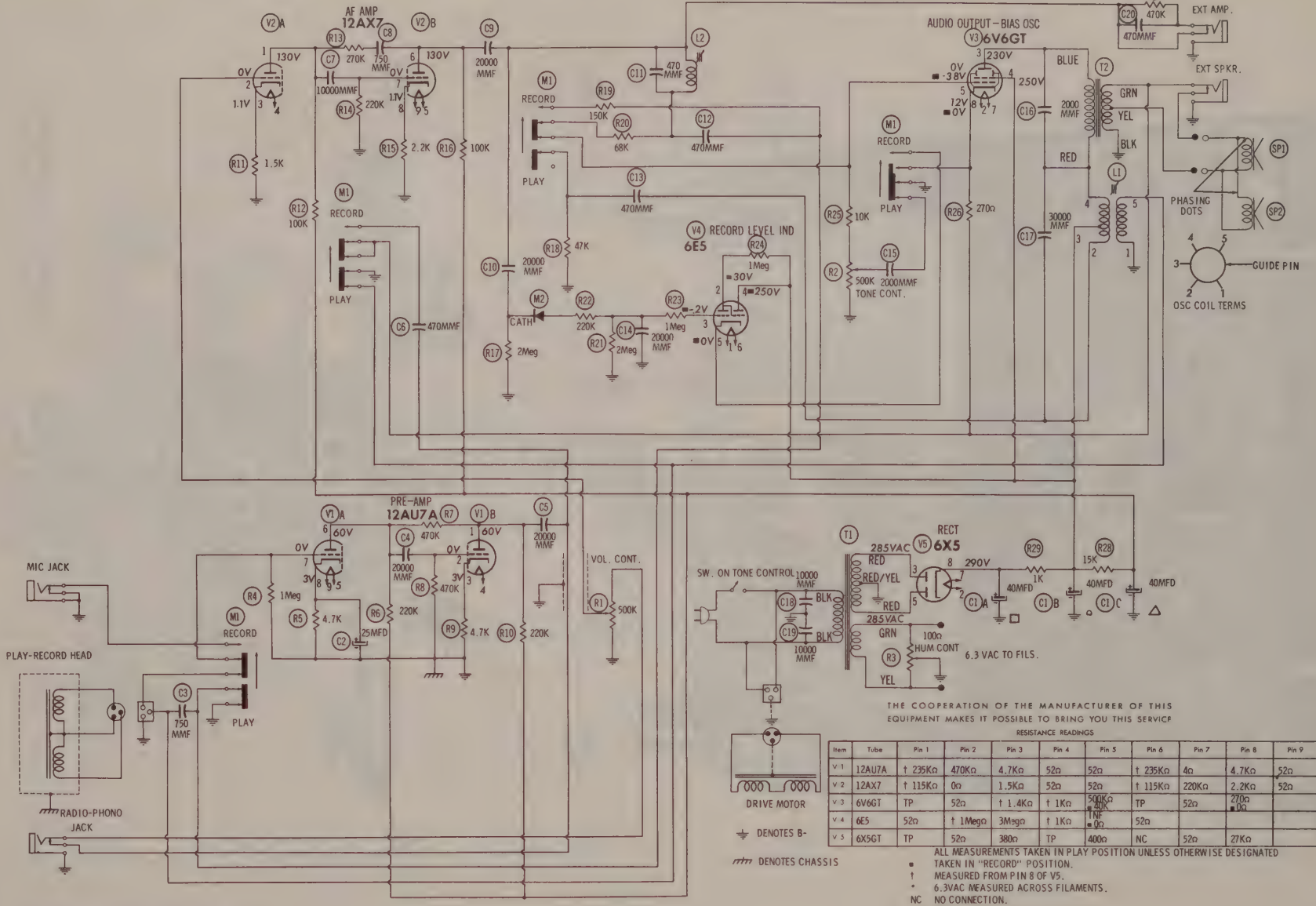


Fig. 6B. Exploded View Of Parts Below Baseplate.



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RESISTANCE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V 1	12AU7A	† 235KΩ	470KΩ	4.7KΩ	52Ω	52Ω	† 235KΩ	4Ω	4.7KΩ	52Ω
V 2	12AX7	† 115KΩ	0Ω	1.5KΩ	52Ω	52Ω	† 115KΩ	220KΩ	2.2KΩ	52Ω
V 3	6V6GT	TP	52Ω	† 1.4KΩ	† 1KΩ	500KΩ ▪ 40K	TP	52Ω	270Ω ▪ 0Ω	
V 4	6E5	52Ω	† 1MegΩ	3MegΩ	† 1KΩ	INF ▪ 0Ω	52Ω			
V 5	6X5GT	TP	52Ω	380Ω	TP	400Ω	NC	52Ω	27KΩ	

ALL MEASUREMENTS TAKEN IN PLAY POSITION UNLESS OTHERWISE DESIGNATED

▪ TAKEN IN "RECORD" POSITION.
† MEASURED FROM PIN 8 OF V5.
* 6.3VAC MEASURED ACROSS FILAMENTS.
NC NO CONNECTION.
TP TIE POINT.

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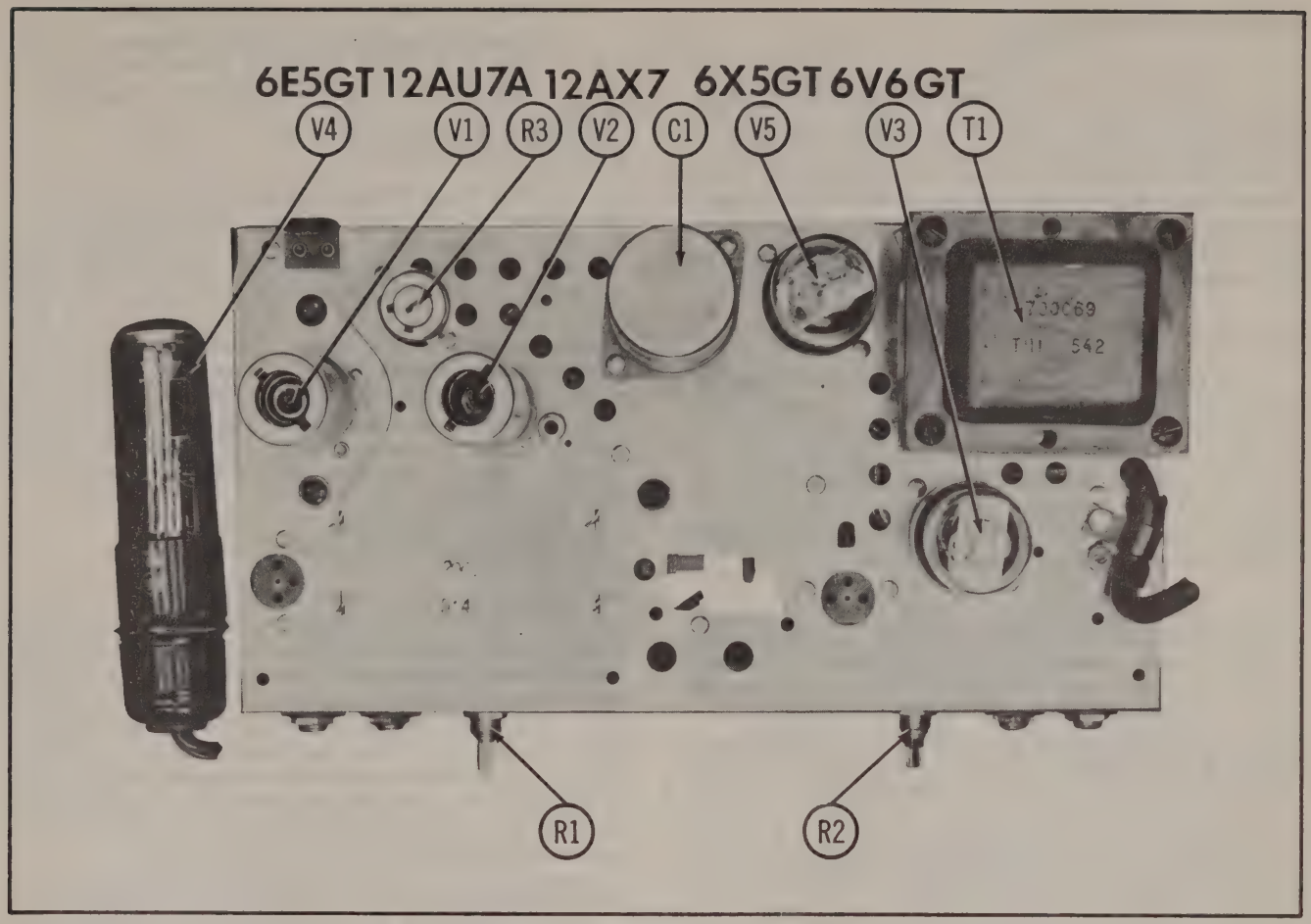


Figure 7

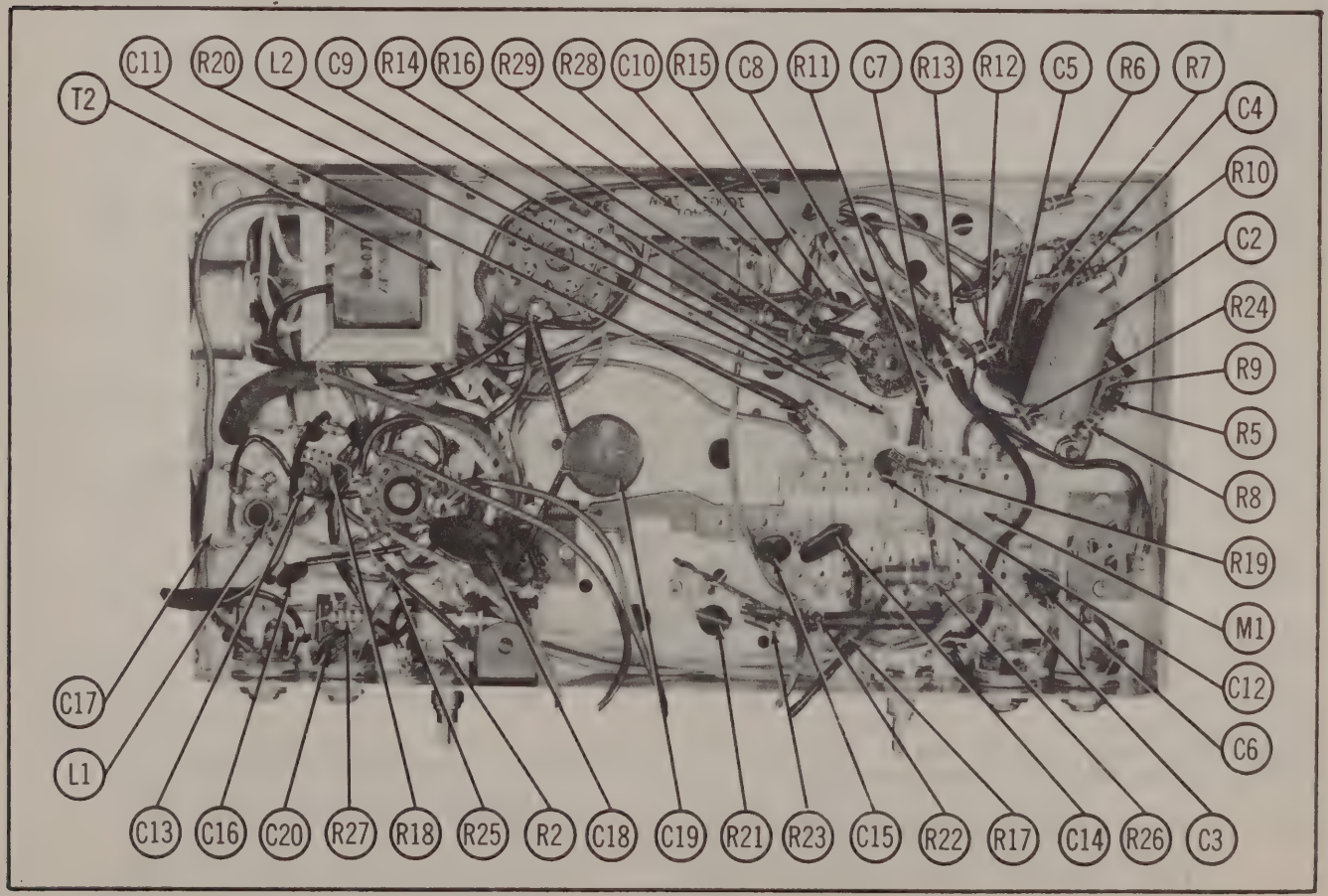


Figure 8

Lifter Arm (23) Adjustment-

This adjusts the distance that the contact strip on the play-record switch will move when going into the record position. If an adjustment is necessary, depress and turn the play-record control (4) clockwise. Loosen the set screw in the lifter arm (23) and rotate control knob 4 to the left or right to center the contact strip with the contacts on the left end of the switch. Make sure lifter arm (23) is down as far as it will go and tighten its set screw.

Play-Record-Erase Head Adjustment-

It is very important that the head be lined up perfectly with the tape. If it is not, low output, loss of high frequencies or track overlap may result. If the head is to be replaced, the complete assembly of the head and the bracket (19) that it mounts in should be changed. The bracket is adjusted to the head and sealed in place at the factory. There are two adjustments to be made which are as follows:

1. One is head height. This is set by placing a .179" gauge (between 11/64" and 3/16") on the motorboard (34) under where the head is mounted. The head is pushed down flush with this gauge and tightened in place and the gauge removed. If a gauge is not obtainable set the head height while the unit is pulling tape. Move the head slowly up until the top edge of the tape is hitting the edge of the tape guide on the motorboard.

2. The second adjustment is for output and frequency response. To set this make a recording of a 3000 cycle signal on a good unit. Place this on the unit that the head is to be aligned on. Connect an output meter or AC voltmeter across the speaker voice coil. Play the 3000 cycle tape, rock the head holder (19) back and forth, screw (26) holding the holder on to the motorboard bracket will allow you to do this, and notice the variation in the output voltage at the voice coil. Tighten the head holder in the position of highest output. Make sure the head was not moved up or down while rocking it. If a 3000 cycle signal tape cannot be made, record a record with some high notes on it on another unit. Play this back on the unit to be adjusted and rock the head to give best high note response.

After setting the height and output check unit for track overlap. To do this take a reel of tape that has no recording on it. Make a recording on the unit that the head has been adjusted on. Do not rewind but take the reel off, reverse them and play the other track. There should be no sound heard. If what was recorded is heard backwards then there is track overlap. If this is the case, the guide on the head holder should be bent up to move the tracks further apart.

Pressure Pad Adjustment-

This applies the correct pressure between the tape and the head. To adjust this, loosen screw (13) that holds pressure pad bracket (15). Turn play record control (4) clockwise. Move bracket (15) forward until the pressure pad moves back against its spring 1/16". Make sure the front edge of the bracket is parallel with the head and tighten screw (13).

NOTE: When ordering a replacement head, be sure to get the complete assembly of head, plug and bracket. The bracket is adjusted to the individual head and sealed at the factory. Also when ordering a replacement motor, be sure to get the complete assembly of motor, pulley and plug. The pulley is turned down on the individual motor and is not interchangeable.

Hum Balance Adjustment-

If tube V1 or V2 is replaced or the head changed the setting of the hum balance pot. R3 should be checked. To do this, connect an external speaker to the unit as described under "To Use An External Speaker". Connect an AC voltmeter with a .1 volt AC scale across the speaker voice coil. Turn the "Volume" and "Tone" control clockwise. Place the play-record control (4) in "Play" position. Put the AC meter on the .1 volt scale and adjust the hum pot. R3, which is located between tubes V1 and V2 on top of the chassis, to its minimum reading. It should not exceed .1 volt. This is the only adjustment required in the amplifier.

Take Up Spring (46) Adjustment-

Place a full 7" reel of tape on the take up reel plate (2). Rewind on the feed reel for about 10 seconds. Place the unit in the "Play" position. The take up reel should start revolving at the same time or a little after the capstan and pressure roller (18) start pulling tape. There should be no looping of the tape before it starts to take up. If the tape loops or doesn't take up at all, bend the take up lever spring (46) at point "A" on exploded view until the recorder takes up properly. Bending the spring outward will increase the take up while bending inward will decrease it.

CAUTION: Do not bend spring (46) to give too much take up or the tape will start to go into fast forward before the pressure roller reaches the capstan.

TROUBLES

1. Spindle (11) binding.
   (a) Lubricate.

2. Improper take up spring (46) adjustment.
   (a) See "Take Up Spring Adjustment".

3. Belt (61) slipping.
   (a) Clean motor pulley and pulley (54).

4. Belt (61) broken.
   (a) Remove bracket (64) and replace belt.

5. Set screw loose in pulley (54).
   (a) Tighten and leave 1/32" to 1/16" end play in spindle.

6. Pulley (54) broken.
   (a) Replace pulley.

Fast Forward Won't Function Properly-

1. See above except for step 2.

Fast Rewind Won't Function Properly-

1. Spindle (11 or 12) binding.
   (a) Lubricate.

2. Belt (62) slipping.
   (a) Clean motor pulley and pulley (55).

3. Belt (62) broken.
   (a) Remove bracket (64) and replace belt.

4. Set screw loose in pulley (55).
   (a) Tighten and leave 1/32" to 1/16" end play in spindle.

5. Pulley (55) broken.
   (a) Replace pulley.

Speed Variation Or Wow-

1. Slippage.
   (a) Clean motor pulley, flywheel and capstan (49) and pressure roller (18) with a petroleum solvent, not carbon tetrachloride. Replace rubber rollers if they appear oil soaked.

2. To much feed reel drag.
   (a) Check adjustment as described under "Take Up Reel Seat And Feed Reel Seat Drag Adjustment".

3. Flat spot on rubber roller (18).
   (a) A rapid thumping sound while the unit is running may indicate a flat spot on the rubber tire. If this condition does not clear up after several minutes of running time, replace the roller.

   (b) If the surface of the rubber roller is not smooth and even, replace the part.

   (c) Should the bearings of the rollers show signs of excessive wear or be extremely wobbly, the rollers should be replaced.

4. Tight feed or take up spindle (11 or 12).
   (a) Check adjustment as described under "Spindle End Play Adjustment".

5. Tight pressure roller (18).
   (a) Lubricate.

6. Tight flywheel shaft (49).
   (a) Lubricate.

7. Pressure pad assembly (15) applying too much pressure against tape.
   (a) Check adjustment as described under "Pressure Pad Adjustment".

LUBRICATION

The lubricants applied at time of manufacture should be sufficient for a long period of time. Approximately once a year, or in the event that parts are replaced, lubricate the unit as follows:

With No. 20 Motor Oil-

1. Take-up reel arm (43) bushing.

2. Feed reel arm (51) bushing.

3. Spindle (11 and 12) bearings.

4. Flywheel (49) bearings.

5. Pressure roller (18) bearing.

With Staput No. 312 Grease Or Lubriplate-

1. Pressure Plate (33) at the slide buttons and the guide on the right side.

2. On the stud of the lifter arm (23).

CAUTION: Do not oil the motor bearing unless absolutely necessary as excess oil will be thrown off and cause slipping of the pulleys and rollers wipe off with a petroleum solvent, such as alcohol. Do not use carbon tetrachloride.

CLEANING

The record-playback head (20), capstan shaft and pressure roller (18) are subject to an accumulation of tape coating residue, which is worn off the tape as it passes these parts. This can cause distortion, weak output and poor erasure. Use a soft cloth and alcohol to clean the head surfaces, capstan and pressure roller.

CAUTION: Do not use a brush or any metallic object when cleaning the record-playback head as this could possibly mar the head surface.

MECHANICAL PARTS LIST

Ref. No.	Part No.	Description	Ref. No.	Part No.	Description
1	460112	Spring Retainer	17	580143	Cloth Washer
2	310144	Reel Plate	18	011236	Pressure Roller
3	100672	Head Cover	19	100556	Head Holder
4	310147	Mechanism Control Knob	20	011312	Play-Record-Erase Head and Plug Assembly
5	100687	Cover			
6	460112	Spring Retainer	21	200288	Slide Button
7	310144	Reel Plate	22	012328	Pressure Roller
8	011309	Top Plate	23	011307	Lifter Arm & Set Screw Assy.
9	310146	Rewind Control Knob	24	460114	Flywheel Retainer
10	310146	Fast Forward Control Knob	25	580141	Flat Washer .315 x .01
11	011319	Spindle Assembly	26	600113	Screw 8-32 x 5/16 Hex. Hd.
12	011319	Spindle Assembly	27	580056	Flat Washer, .188 x 7/16 x .032
13	600180	Screw 6-32 x 5/16 Hex. Hd.	28	420171	Slide Plate Return Spring
14	580043	Flat Washer .142 x 5/16 x 1/32	29	580143	Cloth Washer
15	011315	Pressure Pad Bracket Assembly	30	600243	Phillips Flat Hd. M.S., 6-32 x 1/4
15A	420104	Pressure Pad Spring			
15B	011316	Pressure Pad Assembly	31	200288	Slide Button
16	460111	Spring Retainer	32	420174	Capstan Pressure Spring

MECHANICAL PARTS LIST (Con't.)

Ref. No.	Part No.	Description	Ref. No.	Part No.	Description
33	012327	Pressure Plate Assembly	53	460110	Hair Pin Clip
34	011309	Motorboard Staking Assembly & Riveting	54	011317	Pulley & Set Screw Assembly
			55	011317	Pulley & Set Screw Assembly
35	600111	Screw #6-32 x 1/4 Hex. Hd. M.S.	56	490087	Capstan Drive Belt
36	460117	Control Shaft Retainer	59	580056	Flat Washer, .188 x 7/16 x .032
37	420109	Record Release Spring	60	600111	Hex. Hd. M.S., 8-32 x 1/4
38	100660	Position & Shaft Bracket	61	490053	Take Up Reel Drive Belt
41	420107	Spindle Arm Spring	62	490053	Feed Reel Drive Belt
43	011329	Take Up Reel Arm Assembly	63	011692	Motor, Pulley & Plug Assembly
44	580139	Fibre Washer	64	100654	Shock Mount & Bracket Assy.
45	460110	Hair Pin Clip	65	011321	Fan
46	011328	Take Up Lever & Spring Assembly	66	011693	Speed Control Knob
47	200288	Slide Button	67	420152	Speed Control Shaft Retainer
48	600243	Phillips Flat Hd. M.S., 6-32 x 1/4	68	420151	Speed Control Spring (Upper)
			69	230054	Rubber Washer
49	011327	Flywheel & Capstan	70	420151	Speed Control Spring (Lower)
50	011308	Control Shaft & Lever Assembly	71	100760	Speed Control Bracket
51	011329	Feed Reel Arm Assembly	72		Washer
52	580139	Fibre Washer	73		Screw

ELECTRICAL PARTS LIST

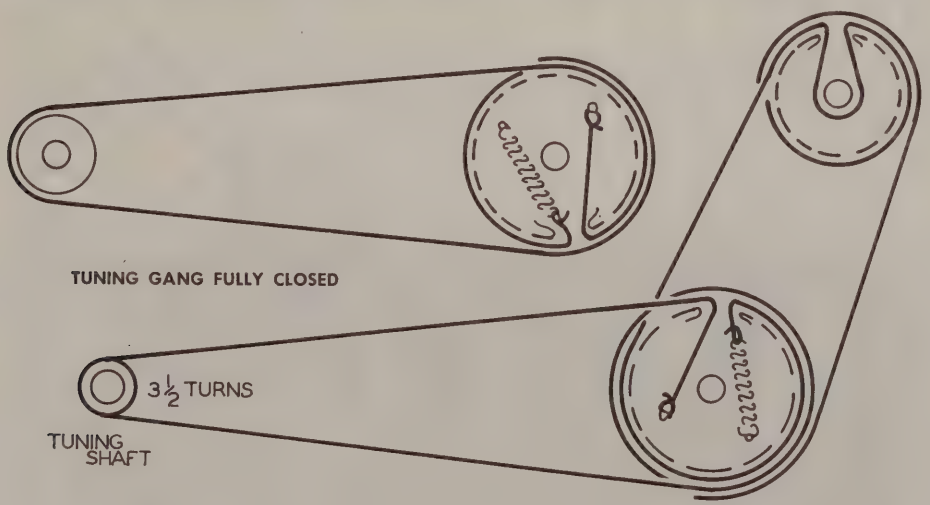
Ref. No.	Part No.	Description	Ref. No.	Part No.	Description
V1		12AU7A, Pre Amp., AF Amp.	R6		Resistor, 220K, 1/2W.
V2		12AX7, AF Amp.	R7		Resistor, 470K, 1/2W.
V3		6V6GT, Audio Output	R8		Resistor, 470K, 1/2W.
V4		6E5GT, Record Level Indicator	R9		Resistor, 4.7K, 1/2W.
V5		6X5GT, Rectifier	R10		Resistor, 220K, 1/2W.
C1A		Elect. Cap., 40MFD. @ 300V.	R11		Resistor, 1.5K, 1/2W.
C1B		Elect. Cap., 40MFD. @ 300V.	R12		Resistor, 100K, 1/2 W.
C1C		Elect. Cap., 40MFD. @ 30V.	R13		Resistor, 270K, 1/2W.
C2		Elect. Cap., 25MFD. @ 25V.	R14		Resistor, 220K, 1/2W.
C3		Cap. Ceramic, 750MMF.	R15		Resistor, 2.2K, 1/2W.
C4		Cap. Ceramic, 20000MMF.	R16		Resistor, 100K, 1/2 W.
C5		Cap. Ceramic, 20000MMF.	R17		Resistor, 2Meg, 1/2W.
C6		Cap. Ceramic, 470MMF.	R18		Resistor, 47K, 1/2W.
C7		Cap. Ceramic, 10000MMF.	R19		Resistor, 150K, 1/2W.
C8		Cap. Ceramic, 750MMF.	R20		Resistor, 68K, 1/2W.
C9		Cap. Ceramic, 20000MMF.	R21		Resistor, 2Meg, 1/2W.
C10		Cap. Ceramic, 20000MMF.	R22		Resistor, 220K, 1/2 W.
C11		Cap. Ceramic, 470MMF.	R23		Resistor, 1Meg, 1/2 W.
C12		Cap. Ceramic, 470MMF.	R24		Resistor, 1Meg, 1/2 W.
C13		Cap. Ceramic, 470MMF.	R25		Resistor, 10K, 1/2 W.
C14		Cap. Ceramic, 20000MMF.	R26		Resistor, 270Ω, 1W.
C15		Cap. Ceramic, 2000MMF.	R27		Resistor, 470K, 1/2W.
C16		Cap. Ceramic, 2000MMF.	R28		Resistor, 15K, 1/2W.
C17		Cap. Mica, 30000MMF.	R29		Resistor, 1K, 10W.
C18		Cap. Ceramic, 10000MMF.	T1		Power Transformer
C19		Cap. Ceramic, 10000MMF.	T2		Output Transformer
C20		Cap. Ceramic, 470MMF.	L1		Osc., Coil
R1		Volume Control, 500K	L2		Choke
R2		Tone Control, On-Off Sw., 500K	M1		Play-Record Switch
R3		Hum Control, 200Ω	M2		Crystal
R4		Resistor, 1Meg, 1/2W.	SP1	011771	PM Speaker
R5		Resistor, 4.7K, 1/2W.	SP2	011771	PM Speaker

RCA VICTOR MODEL
6HF3 (Ch. RC1155 & RS151)

PROPERTY OF
L. F. BLANKENSHIP
3125 [illegible] ST.
DENVER, COLORADO

TRADE NAME	RCA Victor Model 6-HF-3 (Tuner Ch. RC-1155, Audio Ch. RS-151)
MANUFACTURER	RCA Victor Radio & "Victrola" Div., Radio Corp. of America, Camden 2, N.J.
TYPE SET	AC Operated FM-AM Superheterodyne Receiver With 3 Speed Automatic Record Changer
TUBES	Thirteen
POWER SUPPLY	110-120 Volts AC-60 Cycles RATING .84 Amp. @ 117 Volts AC
TUNING RANGE-BROADCAST	540KC-1600KC FREQ. MOD. 88MC-108MC

FOR SERVICE INFORMATION ON RECORD CHANGER - SEE RCA RP-197 — PHOTOFACT SET #273-FOLDER #9 OR RECORD CHANGER MANUAL CM-7.



DIAL CORD STRINGING

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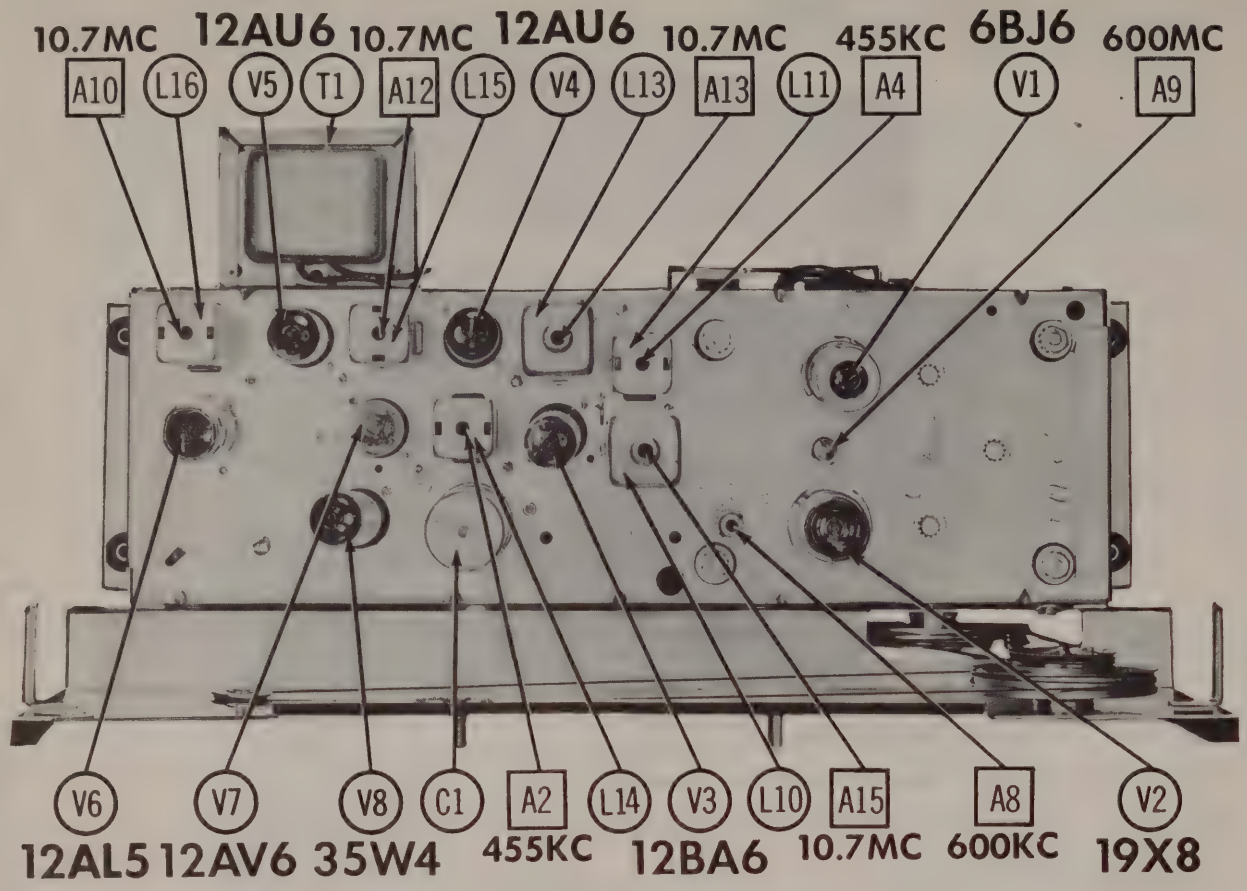
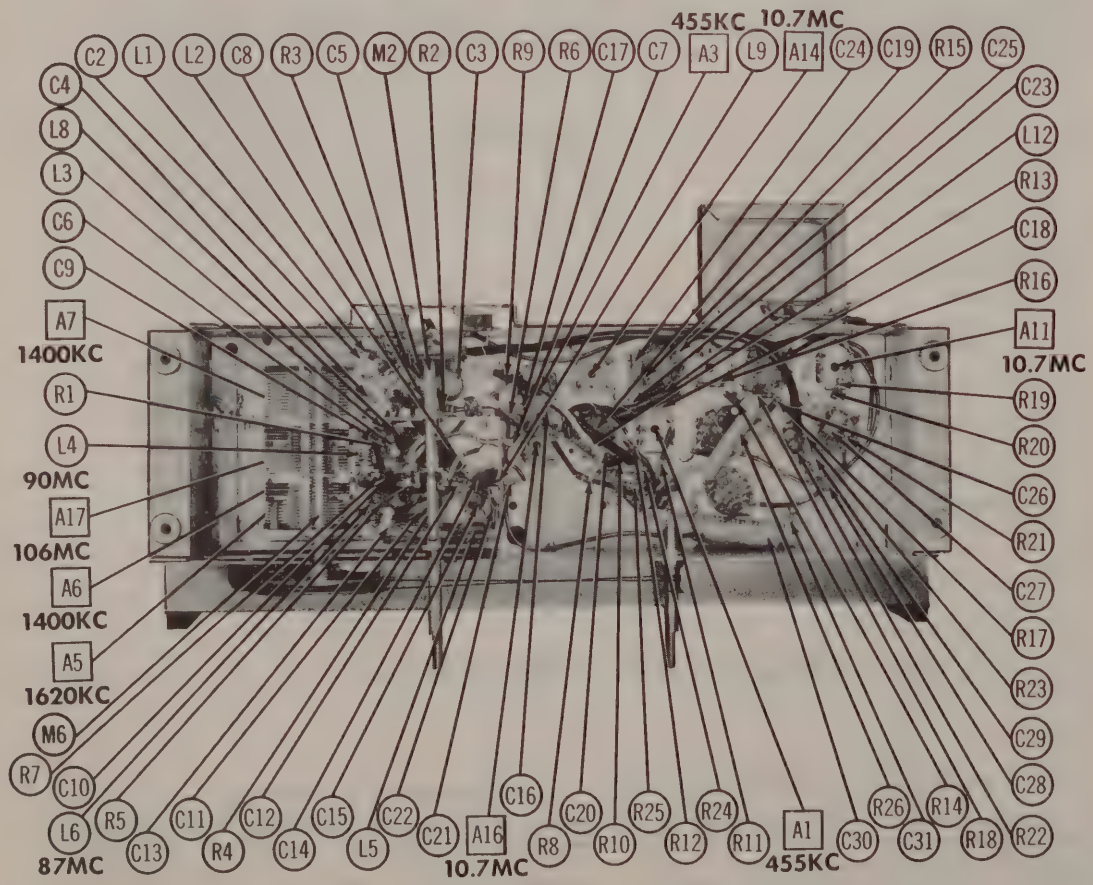


TUNER CHASSIS-TOP VIEW



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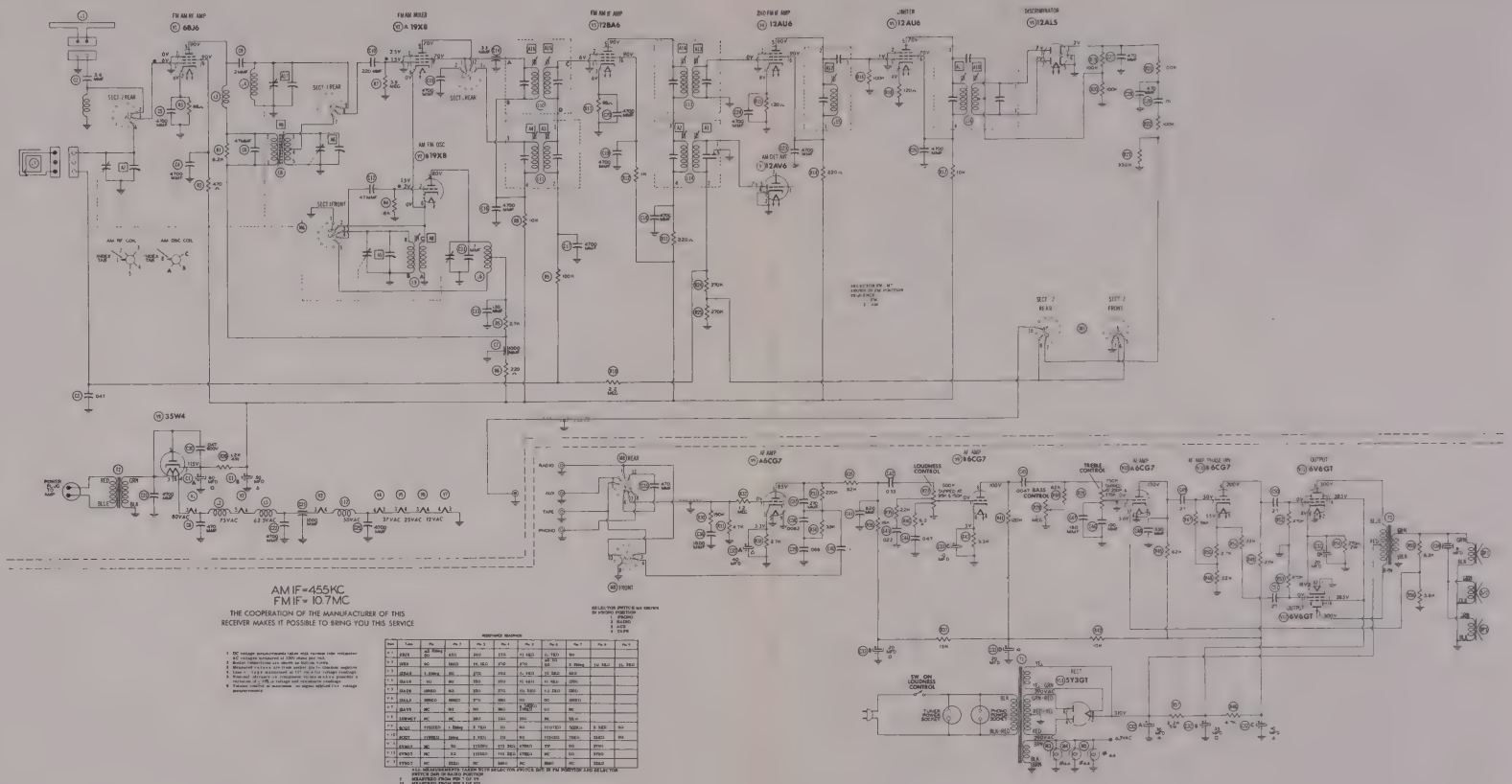

AM IF=455KC
FM IF= 10.7MC

THE COOPERATION OF THE MANUFACTURER OF THIS RECEIVER MAKES IT POSSIBLE TO BRING YOU THIS SERVICE

RESISTANCE VALUES

Item	Tube	Pin	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
		AC 300vg								
V1	6BJ6	DC	6.85	3.65	3.55	11.1kΩ	2.1kΩ	0n		
		AC	18kΩ	11.8Ω	2.7Ω	47Ω	68	2.8Meg	12.1kΩ	21.2kΩ
V2	19X8	1.8Meg	85	270	250	2.1kΩ	23.5kΩ	680Ω		
V3	12BA6	DC	84	250	250	11.4kΩ	11.9kΩ	250Ω		
V4	12AU6	680Ω	84	250	270	10.5kΩ	11.2kΩ	180Ω		
V5	12AU6	300KΩ	84	270	280	90	100	300KΩ		
V6	12AL5	AC	90	90	85	100KΩ	90	AC		
V7	12AV6	AC	AC	260	250	290	AC	58 n		
V8	6CG7	115VAC	1.8Meg	8.1kΩ	120	800	115VAC	500KΩ	8.5kΩ	900
V9	6CB7	115VAC	26Meg	2.45Ω	170	900	115VAC	250Ω	32kΩ	900
V10	6CG7	AC	340	115VAC	115 VAC	470KΩ	99	500	270Ω	
V11	6CG7	AC	340	115VAC	115 VAC	470KΩ	AC	500	270Ω	
V12	6CG7	AC	330Ω	340	340	AC	AC	AC	330Ω	

RESISTANCE VALUES WITH SELECTOR SWITCH IN MYSTIC POSITION

V13	6V6GT	DC	28.5	300	300	28.5	28.5	0	0	0
		AC	0	0	0	0	0	0	0	0
V14	6V6GT	DC	28.5	300	300	28.5	28.5	0	0	0
		AC	0	0	0	0	0	0	0	0
V15	5Y3GT	AC	350							

SELECTOR SWITCH AS SEEN IN MYSTIC POSITION
1 PHONO
2 TAPE
3 AUX
4 RADIO

1. DC voltage measurements taken with normal line voltage.
2. AC voltages measured at 1000 ohms per volt.
3. Antenna input signal 1 volt modulated 30%.
4. Measurements taken with knob marked (A) in clockwise position.
5. Line - range measured at 117 normal voltage readings.
6. Normal allowable tolerance measurements ± 10%.
7. Variable (R) ± 5% in voltage and resistance readings.
8. Measurements taken between ac signal applied to voltage measurements.

A PHOTOFACT STANDARD NOTATION SCHEMATIC
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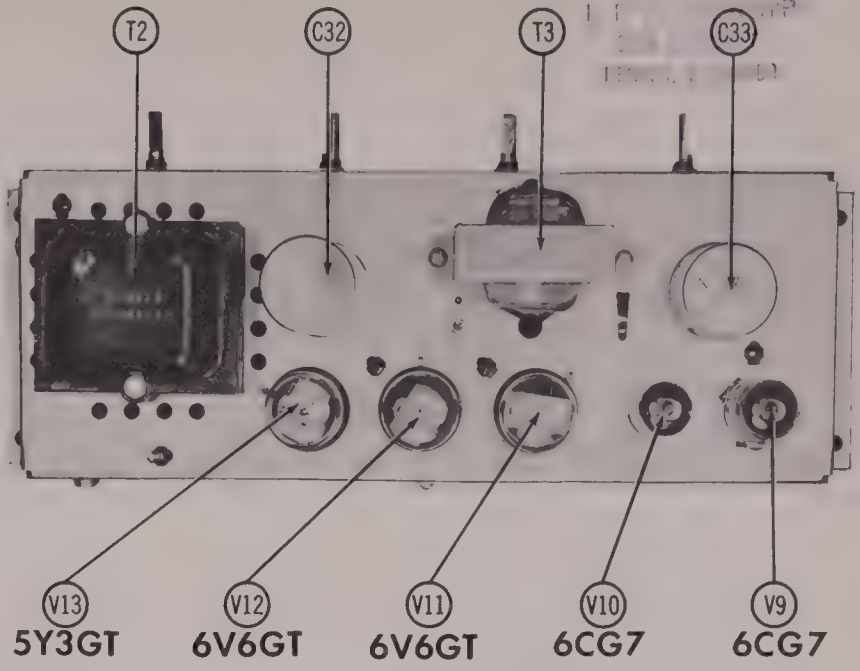
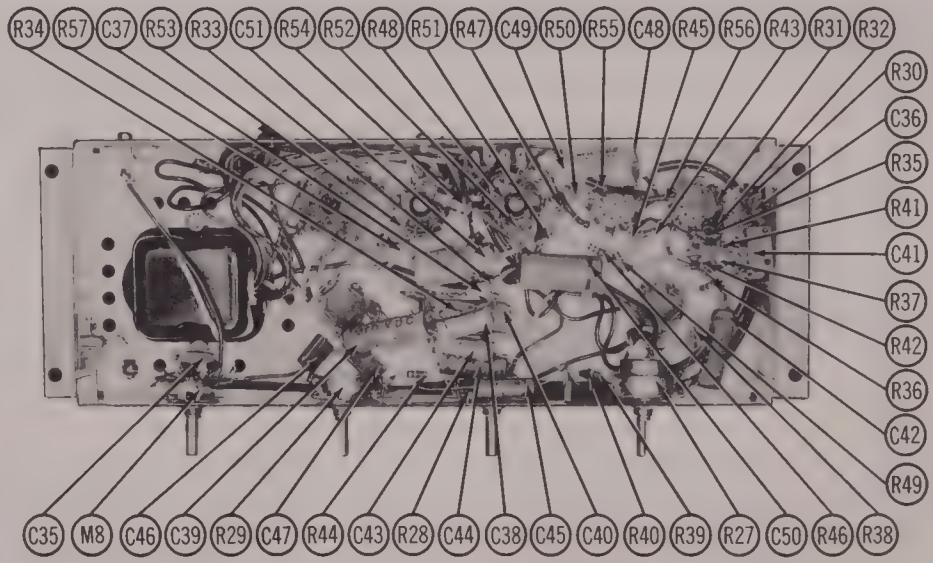


AUDIO CHASSIS - TOP VIEW



AUDIO CHASSIS - BOTTOM VIEW

ALIGNMENT INSTRUCTIONS

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

Volume control should be at maximum position. Output of signal generator should be no higher than necessary to obtain an output reading.
Use an insulated alignment screwdriver for adjusting.
Loop should be maintained in same relative position to chassis as when receiver is in cabinet.
To set pointer, turn tuning capacitor fully closed and set pointer to last reference mark at low frequency end of dial.
Tone control to mid-position.

AM ALIGNMENT

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	BAND SWITCH POS.	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
1.	.01MFD	High side to pin 1 (grid) of 12BA6 (V3). Low side to chassis.	455KC (400~Mod)	AM	Point of non-interference	Across voice coil	A1, A2	Adjust for maximum output.
2.	"	High side to center tap of AM RF coil. Low side to chassis.	"	"	"	"	A3, A4	"
3.		Loop (Radiated)	1620KC	"	Tuning gang fully open	"	A5	"
4.		"	1400KC	"	Tune to 1400KC signal	"	A6, A7	"
5.		"	600KC	"	Tune to 600KC signal	"	A8	Adjust for maximum output while rocking tuning gang.
6.		"	"	"	"	"	A9	Adjust for maximum output. Repeat steps 4, 5 and 6 until no further improvement can be noted.

FM IF ALIGNMENT USING AM SIGNAL GENERATOR AND VTVM

Keep exposed VTVM leads very short and dress leads away from input circuit.
Shunt primary of L13 with 680KΩ when adjusting A14. Shunt secondary of L13 with 680KΩ when adjusting A13. Repeat procedure with L10 when adjusting A15 and A16.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	BAND SWITCH POS.	RADIO DIAL SETTING	CONNECT VTVM	ADJUST	REMARKS
7.	.01MFD	High side to pin 1 (grid) of 12AU6 (V5). Low side to chassis.	10.7MC (Unmod)	FM	Point of non-interference	DC probe to point ⊗. Common to chassis.	A10	Adjust for zero reading. A positive and negative reading will be obtained on either side of the correct setting.
8.	"	"	"	"	"	DC probe to point ⊗. Common to chassis.	A11	Adjust for maximum deflection.
9.	"	High side to pin 1 (grid) of 12AU6 (V4). Low side to chassis.	"	"	"	DC probe thru 220KΩ to pin 1 (grid) of 12AU6 (V5). Common to chassis.	A12	"
10.	"	High side to pin 1 (grid) of 12BA6 (V3). Low side to chassis.	"	"	"	"	A13, A14	"
11.	"	High side to RF (FM) stator lug. Low side to chassis.	"	"	"	"	A15, A16	"

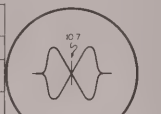


FIG. 1

FM IF ALIGNMENT USING FM SIGNAL GENERATOR AND OSCILLOSCOPE

Use frequency modulated signal with 80% modulation and 450KC sweep. Use 130% sawtooth voltage in scope for horizontal deflection.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	BAND SWITCH POS.	RADIO DIAL SETTING	CONNECT SCOPE	ADJUST	REMARKS
7.	.01MFD	High side to pin 1 (grid) of 12AU6 (V5). Low side to chassis.	10.7MC (450KC Sw)	FM	Point of non-interference	Vert. Amp. to point ⊗. Low side to chassis.	A10, A11	Adjust A10 so that 10.7MC occurs at center of crossover lines similar to Fig. 1. Adjust A11 for maximum amplitude and straightness of crossover lines.
8.	"	High side to pin 1 (grid) of 12AU6 (V4). Low side to chassis.	"	"	"	Vert. Amp. thru 220KΩ to pin 1 (grid) of 12AU6 (V5). Low side to chassis.	A12	Adjust for curve of maximum amplitude and symmetry similar to Fig. 3.
9.	"	High side to pin 1 (grid) of 12BA6 (V3). Low side to chassis.	"	"	"	"	A13, A14	"
10.	"	High side to RF (FM) stator lug. Low side to chassis.	"	"	"	"	A15, A16	Adjust for curve of maximum amplitude and symmetry similar to Fig. 3. Proceed with step 12.

FIG. 2

FM RF ALIGNMENT

Keep exposed VTVM leads very short and dress leads away from input circuit.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	BAND SWITCH POS.	RADIO DIAL SETTING	CONNECT VTVM	ADJUST	REMARKS
12.	270Ω Carbon Resistor	Across FM antenna terminals with 270Ω in each lead.	97MC (Unmod)	FM	Tuning gang fully closed	DC probe thru 220KΩ to pin 1 (grid) of 12AU6 (V5). Common to chassis.	L6	Compress or expand L6 for maximum deflection.
13.	"	"	105MC	"	105MC	"	A17	Adjust for maximum deflection.
14.	"	"	90MC	"	90MC	"	L4	Compress or expand L4 for maximum deflection. Repeat steps 12 and 13 until no further improvement is noted.
15.	"	"	100MC	"	100MC	"	L1	Compress or expand L1 for maximum deflection.

PARTS LIST AND DESCRIPTIONS

TUBES (GENERAL ELECTRIC, SYLVANIA)

ITEM No.	USE	TYPE	NOTES
V1	FM-AM RF Amplifier	6BJ6	
V2	FM-AM Mixer-Oscillator	19X8	
V3	1st. FM-AM IF Amplifier	12BA6	
V4	2nd. FM IF Amplifier	12AU6	
V5	Limiter	12AU6	
V6	Discriminator	12AL5	
V7	AM Detector	12AV6	
V8	Rectifier	35W4	

ELECTROLYTIC CAPACITORS

ITEM No.	RATING		REPLACEMENT DATA						
	CAP.	VOLT.	RCA Victor PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SANGAMO PART No.	SPRAGUE PART No.
C1A	■80	150	73520	AFH2-19	XB004	FP216	TM-8050-150	D-085	R1534 *
B	▲50	150							

*Unit must be ordered from Mfgr.

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING		REPLACEMENT DATA							NOTES
	CAP.	VOLT	RCA Victor PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	
C2	5.6		74182							
C3	.047	200	73558	BPD-05	DF-503	CUB2S47		PT4147	2TM-S47	
C4	4700		73473	BPD-0047	DD-472	K079	811-0047	DC-525	5HK-D47	
C5	4700		73473	BPD-0047	DD-472	K079	811-0047	DC-525	5HK-D47	
C6	47		101372	NP0-SI47	TCZ-47	TZ22	NP0-338-470	ZT-5447	5TCC-Q47	
C7	1000		77084	EF-001	MFT-1000		362-102			
C8	470	500	76992	SI470	D6-471	5W5T47	GP2K-471	UC-5347	1FM-347	
C9	12		70595		TCZ-12	TZ10	NP0K-120			
C10	220	500	101374	SI220	D6-221	5W5T22	GP2K-221	UC-5322	1FM-322	
C11	7		775360							
C12	47		77351	NP0-SI47	TCZ-47	TZ22	NP0-338-470	ZT-5447	5TCC-Q47	
C13	130		77532							
C14	33		100150							
C15	4700		73473	BPD-0047	DD-472	K079	811-0047	DC-525	5HK-D47	
C16	4700		73473	BPD-0047	DD-472	K079	811-0047	DC-525	5HK-D47	
C17	4700		73473	BPD-0047	DD-472	K079	811-0047	DC-525	5HK-D47	
C18	4700		73473	BPD-0047	DD-472	K079	811-0047	DC-525	5HK-D47	
C19	4700		73473	BPD-0047	DD-472	K079	811-0047	DC-525	5HK-D47	
C20	4700		73473	BPD-0047	DD-472	K079	811-0047	DC-525	5HK-D47	
C21	1000		77084	EF-001	MFT-1000		362-102			
C22	4700		73473	BPD-0047	DD-472	K079	811-0047	DC-525	5HK-D47	
C23	4700		73473	BPD-0047	DD-472	K079	811-0047	DC-525	5HK-D47	
C24	4700		73473	BPD-0047	DD-472	K079	811-0047	DC-525	5HK-D47	
C25	4700		73473	BPD-0047	DD-472	K079	811-0047	DC-525	5HK-D47	
C26	4700		73473	BPD-0047	DD-472	K079	811-0047	DC-525	5HK-D47	
C27	470	500	76992	SI470	D6-471	5W5T47	GP2K-471	UC-5347	1FM-347	
C28	470	500	76992	SI470	D6-471	5W5T47	GP2K-471	UC-5347	1FM-347	
C29	.01	200	79316	BPD-01	D6-103	CUB4S1	GP3-333-103	PT4111	4TM-S1	
C30	.047	600	73592	BPD-05	DF-503	CUB6S47		PT6147	6TM-S47	
C31	4700		73473	BPD-0047	DD-472	K079	811-0047	DC-525	5HK-D47	

PARTS LIST AND DESCRIPTIONS (Continued)

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING		REPLACEMENT DATA		NOTES
	OHMS	WATT	RCA Victor PART No.	IRC PART No.	
R1	8200Ω		502282	BTS-8200	
R2	470Ω		502147	BTS-470	
R3	68Ω		502068	BTS-68	
R4	18KΩ		502318	BTS-18K	
R5	2700Ω		502227	BTS-2700	
R6	220Ω		502122	BTS-220	
R7	3.9Meg		502539	BTS-3.9Meg	
R8	10KΩ		502310	BTS-10K	
R9	100KΩ		502410	BTS-100K	
R10	2.2Meg		502522	BTS-2.2Meg	
R11	220Ω		502122	BTS-220	
R12	1000Ω		502210	BTS-1000	
R13	68Ω		502068	BTS-68	
R14	220Ω		502122	BTS-220	
R15	120Ω		502112	BTS-120	
R16	100KΩ		502410	BTS-100K	
R17	10KΩ		502310	BTS-10K	
R18	120Ω		502112	BTS-120	
R19	100KΩ 5%		502410	BTS-100K 5%	
R20	100KΩ 5%		502410	BTS-100K 5%	
R21	100KΩ		502410	BTS-100K	
R22	100KΩ		502410	BTS-100K	
R23	330KΩ		502433	BTS-330K	
R24	270KΩ		502427	BTS-270K	
R25	270KΩ		502427	BTS-270K	
R26	1200Ω	4	76346	1 3/4A-1200	

TRANSFORMER (ISOLATION)

ITEM No.	RATING				REPLACEMENT DATA					
	PRI.	SEC. 1	SEC. 2	SEC. 3	RCA Victor PART No.	Halldorson PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.
T1	117VAC @.26A	117VAC @.20A			101359		P3096			N-51X

COILS (RF-IF)

ITEM No.	USE	DC RES.		REPLACEMENT DATA				NOTES
		PRI.	SEC.	RCA Victor PART No.	MEISSNER PART No.	MERIT PART No.	MILLER PART No.	
L1	FM Ant. Coil	0Ω		77538				1.5 Microhenries
L2	Fil. Choke	1.2Ω		77535	19-1005		4612	11 Microhenries
L3	RF Coil	2.4Ω		77534	19-1006		4624	15.2 Microhenries
L4	FM RF Coil	0Ω		77536				
L5	Fil. Choke	1.2Ω		77535	19-1005		4612	11 Microhenries
L6	FM Osc. Coil	0Ω		77537				Tapped
L7	AM Loop Ant.	2.3Ω		101363				
L8	AM RF Coil	75Ω	4Ω *	77525	14-1076			* Tapped @1.4Ω
L9	AM Osc. Coil	2.2Ω	6.3Ω	77526	14-1060		71-OSC	
L10	1st. FM IF	.2Ω	.2Ω	100112				
L11	1st. AM IF	7Ω	7Ω	76335	16-6758	BC-352	12-C1	
L12	Fil. Choke	1.2Ω		77535	19-1005		4612	11 Microhenries
L13	2nd. FM IF	1.1Ω	.5Ω	77513				
L14	2nd. AM IF	8.5Ω	8.5Ω	76328	16-6758	BC-353	12-C2	
L15	3rd. FM IF	1.3Ω		77512				
L16	Discriminator	.7Ω	1.1ΩCT	77511	17-3494	FM-253	1464	

MISCELLANEOUS

ITEM No.	PART NAME	RCA Victor PART No.	NOTES
M1	Tuning Cap.	101355	5 Gang (AM Sections: 14-235MMF, 12-238MMF, 10-136MMF)
M2	Switch	101356	FM-AM (Rotary, wafer type)

PARTS LIST AND DESCRIPTIONS (Continued)

TUBES (GENERAL ELECTRIC, SYLVANIA)

ITEM No.	USE	TYPE	NOTES
V9	AF Amplifier	6CG7	
V10	AF Amp.-Phase Inverter	6CG7	
V11	Output	6V6GT	
V12	Output	6V6GT	
V13	Rectifier	5Y3GT	

ELECTROLYTIC CAPACITORS

ITEM No.	RATING CAP.	RATING VOLT.	RCA Victor PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SANGAMO PART No.	SPRAGUE PART No.
C32A	▲35	400	101414	AFH4-84	D065	FP431.2	TM-4023	Q-385	TVL-4736
B	■35	400							
C	▲10	350							
D	20	25							
C33A	▲40	25	101357	AFH4-76	D089	FP396.1	TM-4093	Q-305	R2200 *
B	■20	400			BR102	TC22	TD-10-25	FM-0210	
C	10	25							
D	▲20	400							
C34	8	10VAC	100509	RE1026	BBR16-90T			MT-1516	R2201 *
					BBR16-90T †			MT-1516 †	

† Connect negative leads together.
* Unit must be ordered from Mfgr.

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING CAP.	RATING VOLT	RCA Victor PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	NOTES
C35	470	500	39644	SI470	D6-471	5W5T47	GP2K-471		1FM-347	
C36	1800		74850	SI800	D6-182	TP55	GP2-333-182	UC-5218	5GA-D18	
C37	270		101373	SI270	D6-271	TP41	GP2K-271	UC-5327	5GA-T27	
C38	.0082	400	79019							
C39	.068	400	73792	P488N-068		CUB4S68			4TM-S68	
C40	.1	400	73551	P488N-1	DF-104	CUB4P1		PT401	4TM-P1	
C41	820	500	78143	SI820	D6-821	1W5T82	GP2L-820		1FM-382	
C42	.033	400	73552	BPD-03	DF-303	CUB6S33		PT6133	6TM-S33	
C43	.022	200	79925	BPD-02	DD-203	CUB4S22	817-02	PT4122	2TM-S22	
C44	.047	200	73558	BPD-05	DF-503	CUB2S47		PT4147	2TM-S47	
C45	.0047	400	73920	BPD-0047	D6-472	CUB6D47	GP2-333-472	PT6247	6TM-D47	
C46	100	500	39628	SI100	D6-101	5W5T1	GP1K-101	MC235	1FM-31	
C47	180	500	79344	SI180	D6-181	5W5T18	GP2K-181	MC237	1FM-318	
C48	330	500	39640	SI330	D6-331	5W5T33	GP2K-331	UC-5333	1FM-333	
C49	.27	400	78571	P488N-27		CUB4P25		PT4025	6TM-P25	
C50	.27	400	78571	P488N-27		CUB4P25		PT4025	6TM-P25	
C51	.27	400	78571	P488N-27		CUB4P25		PT4025	6TM-P25	

CONTROLS

ITEM No.	RATING RESISTANCE	RATING WATTS	RCA Victor PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	IRC PART No.	MALLORY PART No.	INSTALLATION NOTES
R27A	500KΩ	½	101347	ABT-159		Q18-133XX	UDT-283	Loudness-tapped ⓐ95KΩ and 150KΩ
B	Switch		Not Req.	AK-3		76-1	US26	Attach to R1A
R28A	1Meg	½	78580	B-70	A47-1Meg-Z	Q13-137	U-53	Tone
B	Shaft		Not Req.	Not Req.	FS-3	Not Req.	Not Req.	Attach to R2A
R29A	750KΩ	½	101348	ABT-165				Treble-tapped ⓐ250KΩ and 575KΩ
B	Shaft		Not Req.	AK-3				Attach to R29A

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING OHMS	RATING WATT	RCA Victor PART No.	IRC PART No.	NOTES
R30	150KΩ		502415	BTS-150K	
R31	4700Ω		502247	BTS-4700	
R32	1.2Meg		502512	BTS-1.2Meg	
R33	220KΩ		502422	BTS-220K	
R34	33KΩ		502333	BTS-33K	
R35	82KΩ		502382	BTS-82K	
R36	18KΩ		502318	BTS-18K	
R37	15KΩ		502315	BTS-15K	

PARTS LIST AND DESCRIPTIONS (Continued)

RESISTORS (cont)

ITEM No.	RATING OHMS	RATING WATT	RCA Victor PART No.	IRC PART No.	NOTES
R38	2700Ω		502227	BTS-2700	
R39	22KΩ		502322	BTS-22K	
R40	8200Ω		502282	BTS-8200	
R41	120KΩ		502412	BTS-120K	
R42	10KΩ		502310	BTS-10K	
R43	3300Ω		502233	BTS-3300	
R44	82KΩ		502382	BTS-82K	
R45	82KΩ		502382	BTS-82K	
R46	4700Ω		502247	BTS-4700	
R47	56KΩ		502356	BTS-56K	
R48	22KΩ		502322	BTS-22K	
R49	27KΩ		502327	BTS-27K	
R50	2700Ω		502227	BTS-2700	
R51	22KΩ		502322	BTS-22K	
R52	470KΩ		502447	BTS-470K	
R53	470KΩ		502447	BTS-470K	
R54	270Ω	2	522127	BTB-270	
R55	8200Ω		502282	BTS-8200	
R56	5600Ω		502256	BTS-5600	
R57	2200Ω	5	73637	1 3/4A-2250	

TRANSFORMER (POWER)

ITEM No.	RATING PRI.	RATING SEC. 1	RATING SEC. 2	RATING SEC. 3	RCA Victor PART No.	Halldorson PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.
T2	117VAC	610VCT	5VAC	6.3VAC	101354	P9305 ①	P2951 ①		22R02 ①	R-9B ①
	ⓐ.84A	ⓐ.075A	ⓐ2A	ⓐ2.72A						

① Drill new mounting holes.

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE PRI.	IMPEDANCE SEC.	RCA Victor PART No.	Halldorson PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	NOTES
T3	8.3KΩ	6-8Ω	101358	Z1011	A-2904 ①	A-3870	22S56	S-55X	① Drill one new mounting hole

SPEAKER

ITEM No.	RATINGS SIZE	RATINGS FIELD	RATINGS V. C. IMP.	RCA Victor PART No.	QUAM PART No.	RCA TYPE No.	NOTES
SP1	12"	PM	6-8Ω	100897	12A10X	412S7	
SP2	3½"	PM	6-8Ω	100465	3A15TZ6.6		
SP3	3½"	PM	6-8Ω	100465	3A15TZ6.6		

PHONO CARTRIDGE

ITEM No.	RCA Victor PART No.	ASTATIC PART No. CARTRIDGE	ASTATIC PART No. NEEDLE	ELECTRO-VOICE PART No. CARTRIDGE	ELECTRO-VOICE PART No. NEEDLE	REMARKS
M3	100653	55-T	GD-J	47	0-1 or S-1 & 0-3	

ASTATIC AND ELECTRO-VOICE NEEDLE LISTINGS SHOWN ABOVE ARE SPECIFIED FOR THE RESPECTIVE REPLACEMENT CARTRIDGES LISTED. FOR ORIGINAL CARTRIDGE NEEDLE REPLACEMENTS SEE BELOW.

PHONO NEEDLE

(FOR REPLACEMENT IN ORIGINAL EQUIPMENT CARTRIDGE)

ITEM No.	RCA Victor PART No.	JENSEN PART No.	PERMO PART No.	WALCO PART No.	REMARKS
M4		*S-67 or †S-66 or ♦†S-66SD or ♦S-66D	†AC-434 or ♦†AC-434D1 or †♦AC-434D2 or ♦AC-434D	† W-75TPS or ♦†W-75DS or ♦W-75TPD	* Metal † Jewel ♦ Diamond

MISCELLANEOUS

ITEM No.	PART NAME	RCA Victor PART No.	NOTES
M5	Dial Light	11891	#44
M6	Dial Light	11891	#44
M7	Jewel Lamp	11891	#44
M8	Switch	101350	Selector (Rotary, wafer type)
	Knob	100469	Control (5 used)
	Knob	101364	Tuning
	Dial	101365	AM & FM

PHOTOFACT* Folder
*TRADE MARK

TRUETONE MODEL 2D2524A

PROPERTY OF
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MEADE ST.
ORADO

IMPORTANT FILING NOTICE

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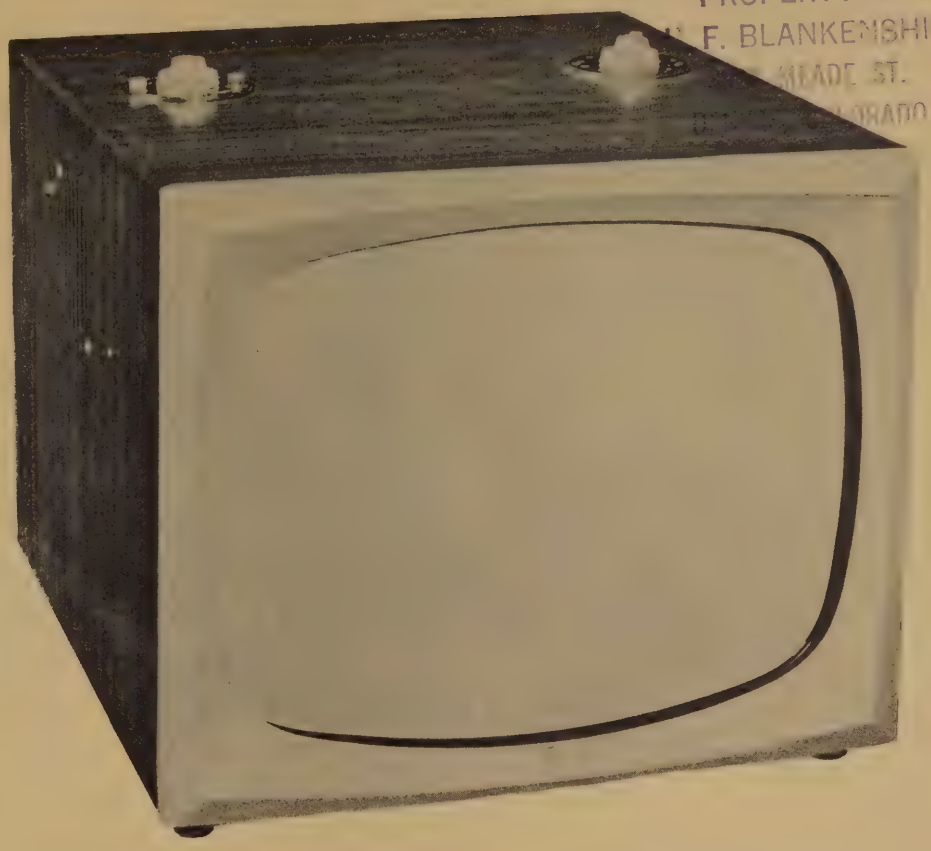
Merely insert the corresponding folder on this model in this envelope to retain proper filing and indexing order.



TRADE NAME	Truetone Model 2D2524A
SUPPLIER	Western Auto Supply Co., 2107 Grand Avenue, Kansas City, Mo.
TYPE SET	Television
TUBES	Fifteen
POWER SUPPLY	105-115 Volts AC-60 Cycle RATING 1.36 Amp. @ 115 Volts AC
TUNING RANGE	Channels 2 thru 13, Video IF 26.75MC, Sound IF 22.25MC (Intercarrier)

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TRUETONE
MODEL 2D2524A

HOWARD W. SAMS & CO., INC. • Indianapolis 5, Indiana

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DISASSEMBLY INSTRUCTIONS

CHASSIS REMOVAL

1. Remove 7 push-on type control knobs from top panel of cabinet.

2. Remove 4 metal screws. Remove rear cover.

3. Place cabinet face down on a soft surface.

4. Remove 2 metal screws holding AC interlock and antenna bracket.

5. Remove 2 bottom chassis bolts and return receiver to normal upright position.

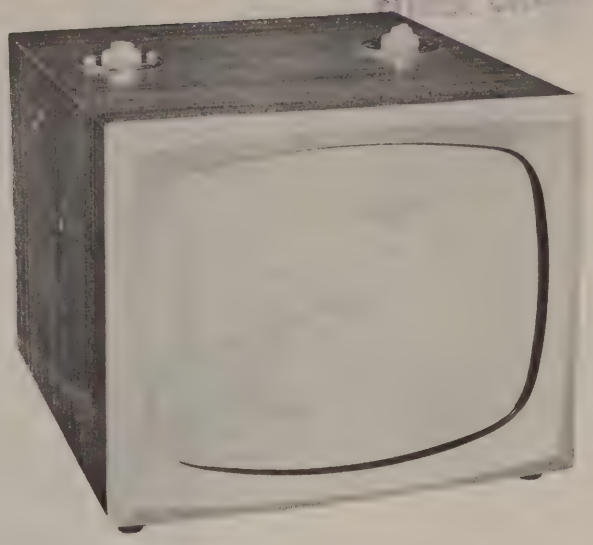
6. Disconnect speaker leads, yoke leads and picture tube socket.

7. Remove ion trap and centering magnet removing 2 metal screws. Remove yoke assembly.

8. Remove 2 metal screws from each side of cabinet.

9. Remove chassis by pulling straight out from cabinet.

10. Remove 2 speaker nuts. Remove speaker.



MODEL
2D2524A

TRUETONE
MODEL 2D2524A

SERVICING IN THE FIELD

TUNER OSCILLATOR ADJUSTMENTS

Touch-up adjustments of the VHF tuner oscillator circuit may be accomplished by removal of the channel selector and fine tuning knobs. Also, remove 2 metal screws and remove escutcheon plate. Adjustments are accessible, one at a time, thru the small hole in the chassis to the rear of the channel selector shaft.

PICTURE TUBE SAFETY GLASS CLEANING

For picture tube safety glass cleaning, it is necessary to remove chassis. (See disassembly instructions).

PICTURE TUBE REMOVAL

For picture tube removal it is necessary to remove chassis. (See disassembly instructions).

SERVICE ADJUSTMENT LOCATION

See tube placement chart on page 5.

HORIZONTAL OSCILLATOR FIELD ADJUSTMENT

For adjustment of the horizontal oscillator it is necessary to remove the rear cover and supply power to the chassis. Adjustment is located on the tube side of the chassis. Set the horizontal hold control to the center of its range and adjust the horizontal phase slug (L24) until the picture synchronizes horizontally.

SOUND IF DETECTOR BUZZ ADJUSTMENT

To eliminate sound IF detector buzz, adjust the buzz control (R7) located on the tube side of the chassis for maximum volume and minimum buzz.

HORIZONTAL SIZE CONTROL

Horizontal size control is a brass sleeve located on the neck of the picture tube and slides between the yoke and the picture tube. Push sleeve into yoke to decrease size and pull out to increase size.

CENTERING

Centering is accomplished mechanically by adjusting two magnetic rings around the neck of the picture tube, located flush against the deflection yoke. Rotate the two rings around the neck of the tube until the picture is properly centered.

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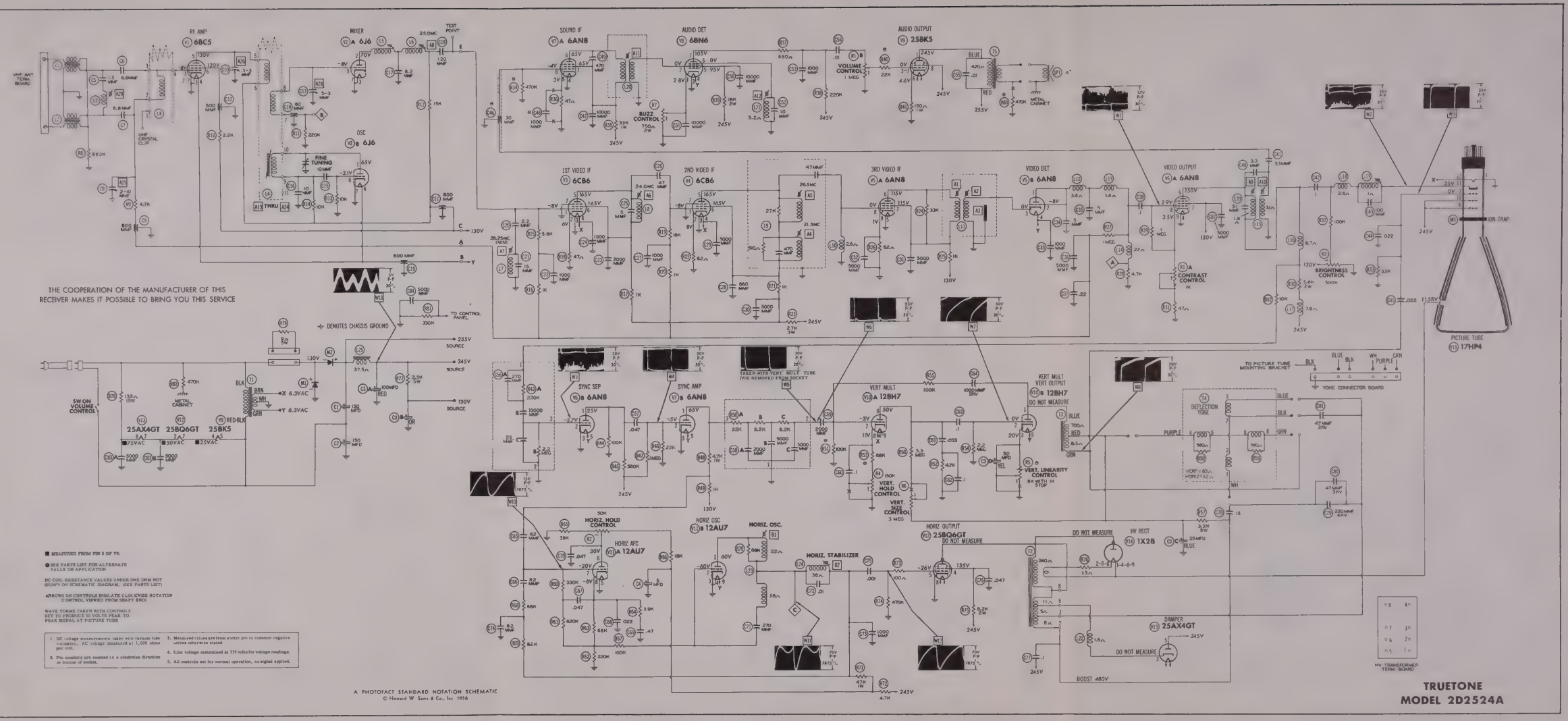
RF AMP V1 6BC5
MIXER V2A 6J6
OSC V2B 6J6
SOUND IF V7A 6AN8
AUDIO DET V8 6BN6
AUDIO OUTPUT V9 25BK5
1ST VIDEO IF V3 6CB6
2ND VIDEO IF V4 6CB6
3RD VIDEO IF V5A 6AN8
VIDEO DET V5B 6AN8
VIDEO OUTPUT V6A 6AN8
SYNC SEP V6B 6AN8
SYNC AMP V7A 6AN8
VERT MULT V10A 12BH7
VERT MULT OUTPUT V10B 12BH7
HORIZ OSC V11B 12AU7
HORIZ AFC V11A 12AU7
HORIZ OUTPUT V12 25BQ6GT
HV RECT V14 1X28
DAMPER V13 25AX4GT
PICTURE TUBE V15 17HP4
RECTIFIER V13 25AX4GT
V12 25BQ6GT
V9 25BK5
VOLUME CONTROL
BUZZ CONTROL
FINE TUNING
CONTRAST CONTROL
BRIGHTNESS CONTROL
VERT. HOLD CONTROL
VERT. SIZE CONTROL
VERT. LINEARITY CONTROL
HORIZ. HOLD CONTROL
HORIZ. STABILIZER
DEFLECTION YOKE
ION TRAP
TO CONTROL PANEL
TO PICTURE TUBE MOUNTING BRACKET
YOKE CONNECTOR BOARD
HV TRANSFORMER TERM BOARD
DENOTES CHASSIS GROUND
DO NOT MEASURE
BOOST 480V
METAL CABINET
VHF ANT TERM BOARD
UHF CRYSTAL CLIP
TEST POINT
THE COOPERATION OF THE MANUFACTURER OF THIS RECEIVER MAKES IT POSSIBLE TO BRING YOU THIS SERVICE
MEASURED FROM PIN 8 OF V8.
SEE PARTS LIST FOR ALTERNATE VALUE OR APPLICATION
DC COIL RESISTANCE VALUES UNDER ONE OHM NOT SHOWN ON SCHEMATIC DIAGRAM. (SEE PARTS LIST)
ARROWS ON CONTROLS INDICATE CLOCKWISE ROTATION (CONTROL VIEWED FROM SHAFT END)
WAVE FORMS TAKEN WITH CONTROLS SET TO PRODUCE 50 VOLTS PEAK-TO-PEAK SIGNAL AT PICTURE TUBE
1. DC voltage measurements taken with vacuum tube voltmeter; AC voltage measured at 1,000 ohms per volt.
2. Pin numbers are counted in a clockwise direction on bottom of socket.
3. Measured values are from socket pin to common negative unless otherwise stated.
4. Line voltage maintained at 117 volts for voltage readings.
5. All controls set for normal operation, no signal applied.
A PHOTOFACT STANDARD NOTATION SCHEMATIC
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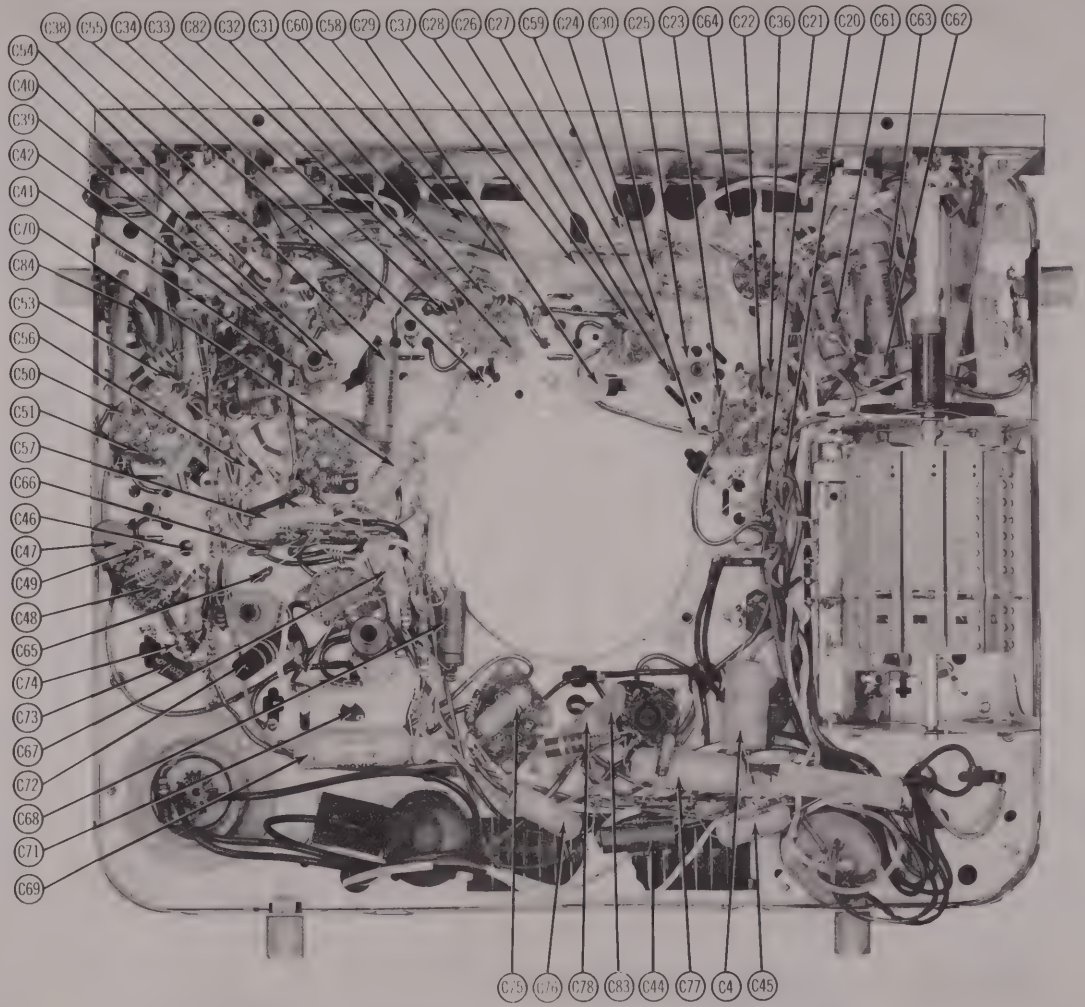
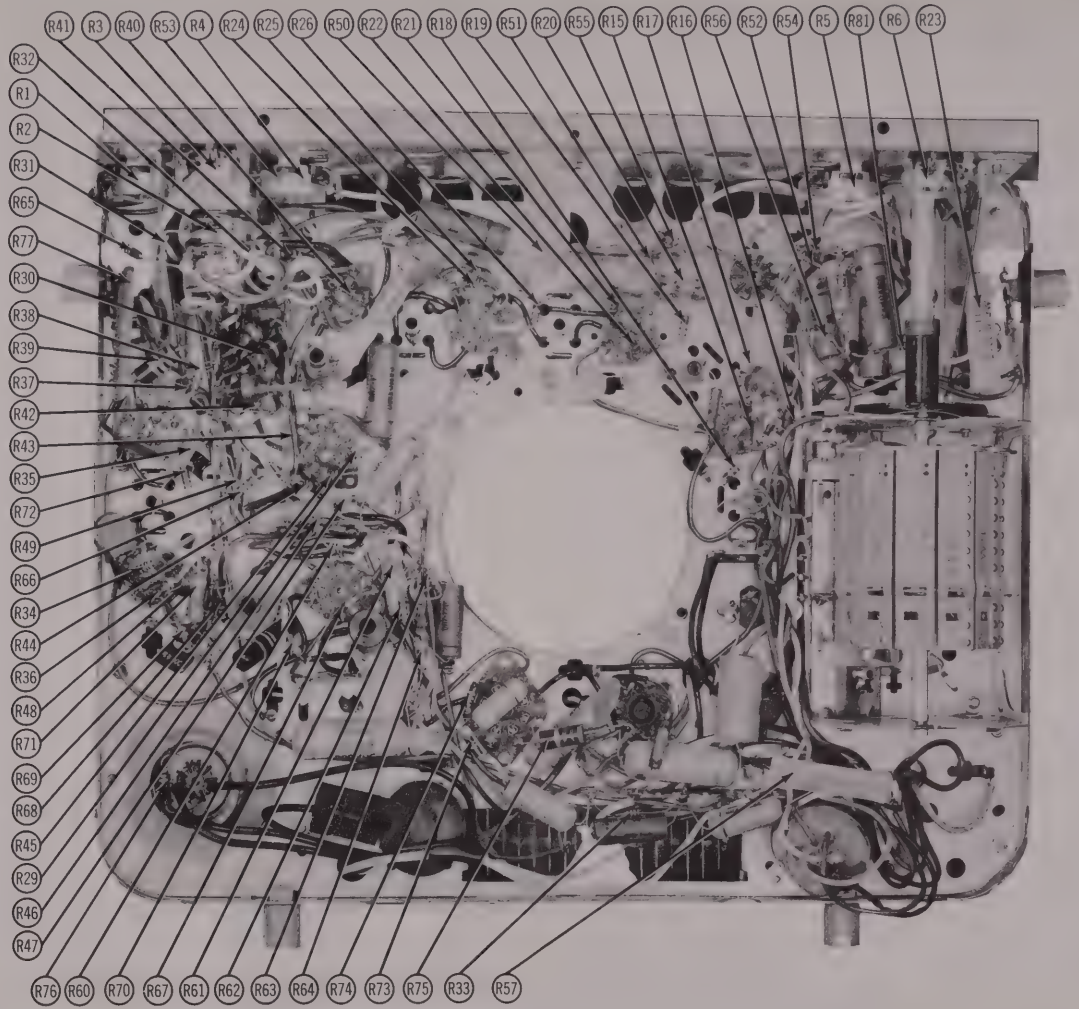
TRUETONE MODEL 2D2524A

TRUETONE MODEL 2D2524A



CHASSIS BOTTOM VIEW-CAPACITOR IDENTIFICATION



CHASSIS BOTTOM VIEW-RESISTOR IDENTIFICATION

TRUETONE
MODEL 2D2524A

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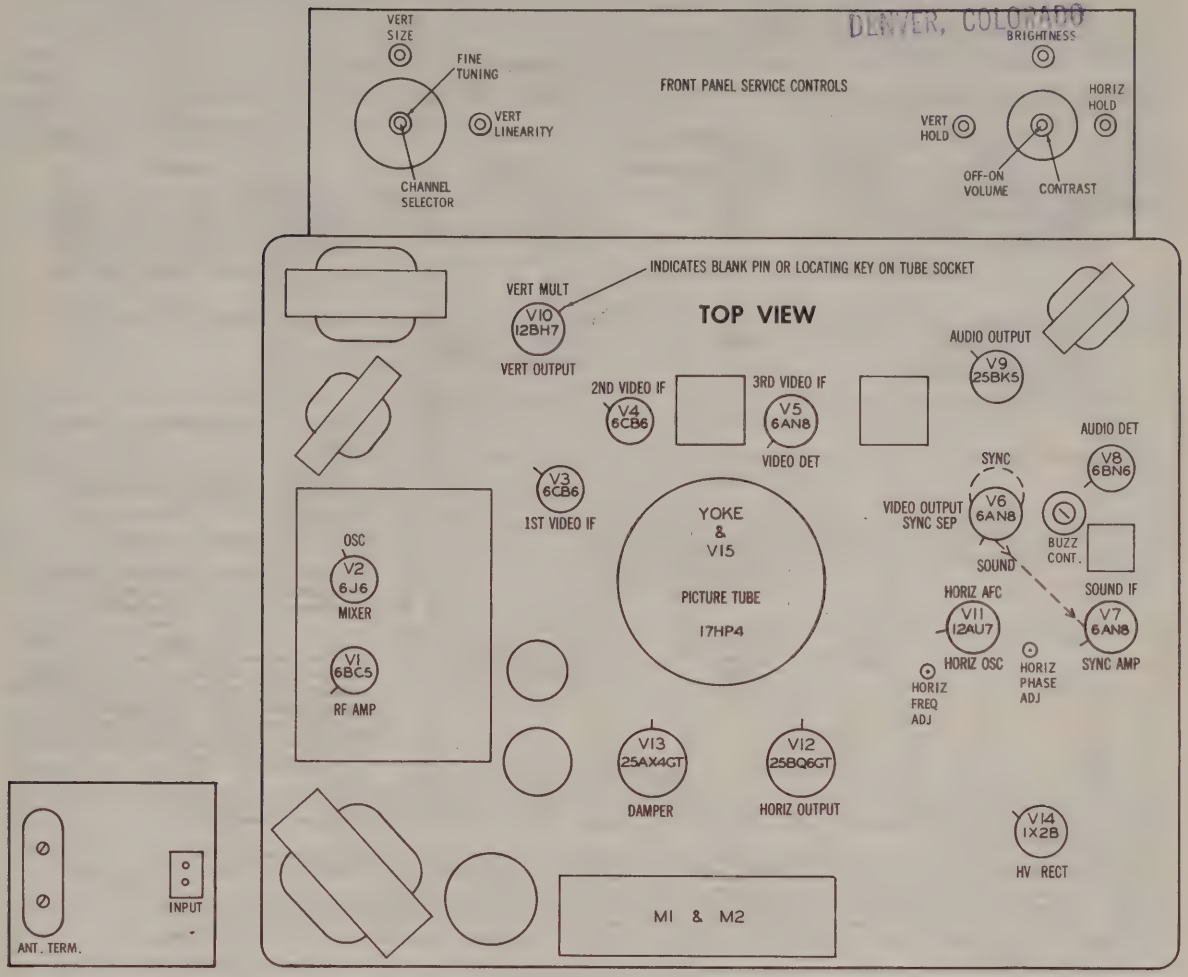
DENVER, COLORADO

TUBE PLACEMENT CHART



TUBE FAILURE CHECK CHART

The following chart lists tubes whose failures are most likely to produce the indicated symptoms. Refer to tube placement chart for location and type of tube.

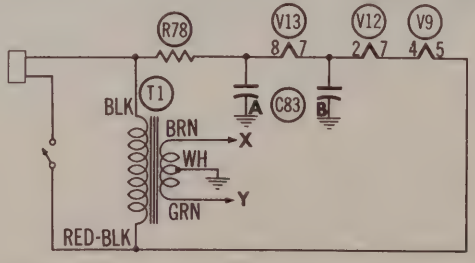
POWER SUPPLY FAILURE
No raster, no sound - Selenium Rectifiers (M1 & M2)

LOSS OF PICTURE OR SOUND
No pic, no sound, has raster - V2, V3, V4, V5, V6
No pic, no sound, has snow - V1, V2, V3
No pic, has sound, has raster - V6, V15
Has pic, no sound - V7, V8, V9

SYNC FAILURE
No vert. sync - V7, V10
No horiz. sync - V7, V11
No vert. or horiz. sync - V6, V7

SWEEP FAILURE
No raster, has sound - V11, V12, V13, V14, V15
No vertical deflection - V10
Poor vert. linearity or foldover - V10
Poor horiz. linearity or foldover - V11, V12, V13
Narrow picture - V11, V12, V13, V14, M1, M2
Vert. off freq. - V7, V10
Horiz. off freq. - V7, V11

NOTE: Since this receiver employs tubes used in a series-parallel filament network, an open filament in any tube in series may cause the set to be inoperative. (See Circuit below).



TRUETONE
MODEL 2D2524A

ALIGNMENT INSTRUCTIONS

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

Use an isolation transformer to protect the test equipment.
The high voltage lead should be securely taped away from the chassis.
Do not remove the horizontal oscillator tube V11 to disable the high voltage.

VIDEO IF ALIGNMENT

Remove the oscillator-mixer tube (V2) and replace with a 6J6 which has pin 1 removed. This will disable the local oscillator and reduce the possibility of erroneous indications.
Connect the synchronized sweep voltage from the sweep generator to the horizontal input of the oscilloscope for horizontal deflection.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
1.	.001MFD	High side to pin 8 (grid) of 6AN8 (V5). Low side to chassis.	25MC (10MC Swp)	23.9MC 26.3MC	Any	Vert. Amp. thru 10KΩ to point (A). Low side to chassis.	A1, A2, A3	Connect a short jumper from pin 5 (plate) to pin 6 (screen) of 6CB6 (V4). Adjust for response similar to Fig. 1 with markers at 90%. A3 is a coupling rod and affects bandwidth. Remove short from pin 5 to pin 6 of V4.
2.	Direct	High side to an ungrounded tube shield floating over oscillator-mixer tube. Low side to chassis.	Not used	21.3MC (Unmod)	"	USE VTVM. DC probe to point (A). Common to chassis.	A4	Adjust for maximum deflection.
3.	"	"	"	26.5MC	"	"	A5	Adjust for maximum deflection. Repeat step 2.
4.	"	"	"	24.0MC	"	"	A6	Adjust for maximum deflection. Attenuate generator to maintain not more than 2 volts deflection on VTVM.
5.	"	"	"	28.25MC	"	"	A7	Adjust for MINIMUM deflection.
6.	"	"	"	25.0MC	"	"	A8	Adjust for maximum deflection. Attenuate generator to maintain not more than 2 volts deflection on VTVM. Repeat step 5.
7.	"	"	25MC (10MC Swp)	21.3MC 23.8MC 26.65MC	"	Vert. Amp. thru 10KΩ to point (A). Low side to chassis.		Check for response similar to Fig. 2. Rock A8 for flat response. Increase sweep generator output and use high scope gain to view 22.25MC trap region. Adjust A4 so that 21.25 MC appears at peak of pop-up portion preceding trap notch. 22.25MC should fall in trap notch. If response is not similar to Fig. 2, repeat steps 1 thru 7.

SOUND IF ALIGNMENT

Remove the dummy converter tube and replace the original 6J6 in its socket. Tune in a TV station and adjust the fine tuning control until sound bars just appear in the picture. Adjust A9 fully counter clockwise and then clockwise until the horizontal scanning line are smooth and continuous.
Readjust the fine tuning control for clearest picture and best sound. Insert and attenuator in series with the antenna and the receiver antenna terminals so that the signal may be varied from weak to strong. If a suitable attenuator is not available, stray feed the signal to the set by placing the antenna lead-in near the antenna terminals of the receiver.
Reduce the signal input to the receiver so that the signal falls below the limiting level of the 6BN6 limiter-detector as evidenced by a "HISS" in the sound. Adjust the secondary of the sound take-off transformer (A10), the sound IF transformer (A11), the quadrature coil (A12) and the buzz control R7 for maximum sound and minimum buzz. If the hiss disappears during alignment, increase attenuation until the hiss reappears.

OSCILLATOR ALIGNMENT

The channel oscillator screws are reached through a hole just to the rear of the fine tuning shaft. The correct oscillator adjustment screws are accessible through this hole as the channel switch is turned to each channel. Connect the negative lead of a 1.5 volt bias battery to the ungrounded side of C37. Connect the positive lead to chassis.
Connect the synchronized sweep voltage from the sweep generator to the horizontal input of the oscilloscope for horizontal deflection.
The sweep generator output lead should be terminated with its characteristic impedance, usually 50 ohms.
Set the fine tuning control to the mid-position of its range.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
8.	Two 120Ω Carbon Resistors	Across antenna terminals with 120Ω in each lead.	195MC (10MC Swp)	193.25MC 197.75MC	10	Vert. Amp. thru 10KΩ to point (A). Low side to chassis.	A13	Adjust to place sound marker in trap notch as in Fig. 3. Use high scope gain and increase sweep generator output to view trap region. Video marker should fall at 50% on response curve.
			213MC (10MC Swp)	211.25MC 215.75MC	13		A14	
			207MC (10MC Swp)	205.25MC 209.75MC	12		A15	
			201MC (10MC Swp)	199.25MC 203.75MC	11		A16	
			189MC (10MC Swp)	187.25MC 191.75MC	9		A17	
			183MC (10MC Swp)	181.25MC 185.75MC	8		A18	
			177MC (10MC Swp)	175.25MC 179.75MC	7		A19	
			85MC (10MC Swp)	83.25MC 87.75MC	6		A20	
			79MC (10MC Swp)	77.25MC 81.75MC	5		A21	
			69MC (10MC Swp)	67.25MC 71.75MC	4		A22	
			63MC (10MC Swp)	61.25MC 65.75MC	3		A23	
			57MC (10MC Swp)	55.25MC 59.75MC	2		A24	

ALIGNMENT INSTRUCTIONS (cont)

RF AND MIXER ALIGNMENT

Leave the bias battery connected as under "Video IF Alignment".
Connect the synchronized sweep voltage from the sweep generator to the horizontal input of the oscilloscope for horizontal deflection.
The sweep generator output lead should be terminated with its characteristic impedance, usually 50 ohms.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
9.	Two 120Ω Carbon Resistors	Across antenna terminals with 120Ω in each lead.	195MC (10MC Swp)	193.25MC 197.75MC	10	Vert. Amp. thru 10KΩ to point (B). Low side to chassis.	A25, A26, A27	Adjust for response similar to Fig. 4 with marker at 90%.
10.	"	"	69MC (10MC Swp)	67.25MC 71.75MC	4	"		Check for response similar to Fig. 4. If markers fall below 70% on any channel, make SLIGHT compromise adjustment of A26, A27 and A28 with channel selector set for that channel. Recheck all other channels to see that they have not been seriously affected.
			213MC (10MC Swp)	211.25MC 215.75MC	13			
			207MC (10MC Swp)	205.25MC 209.75MC	12			
			201MC (10MC Swp)	199.25MC 203.75MC	11			
			189MC (10MC Swp)	187.25MC 191.75MC	9			
			183MC (10MC Swp)	181.25MC 185.75MC	8			
			177MC (10MC Swp)	175.25MC 179.75MC	7			
			85MC (10MC Swp)	83.25MC 87.75MC	6			
			79MC (10MC Swp)	77.25MC 81.75MC	5			
			63MC (10MC Swp)	61.25MC 65.75MC	3			
			57MC (10MC Swp)	55.25MC 59.75MC	2			
11.	"	"	Not used	105MC	2	Use VTVM DC probe to point (A). Common to chassis.	A28	Adjust for MINIMUM deflection.

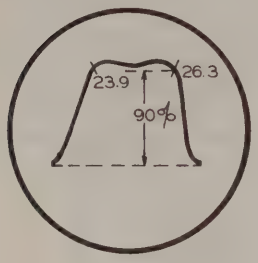


FIG.1

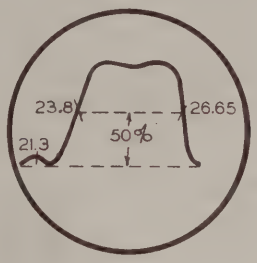


FIG.2

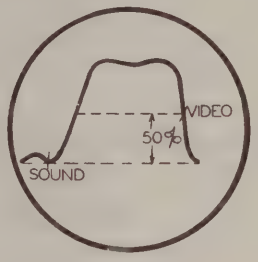


FIG.3

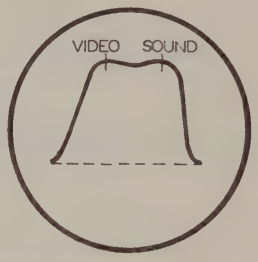
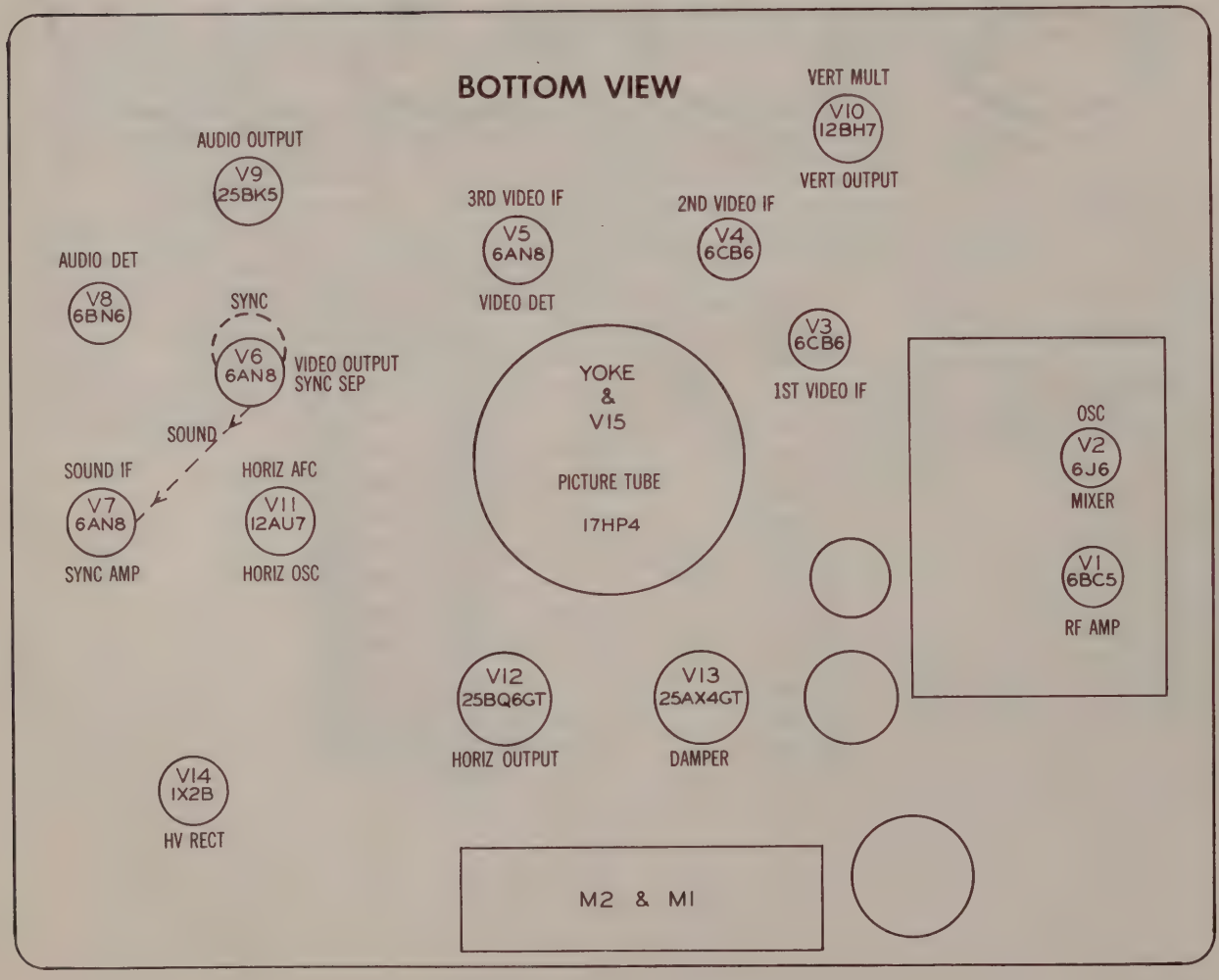


FIG.4

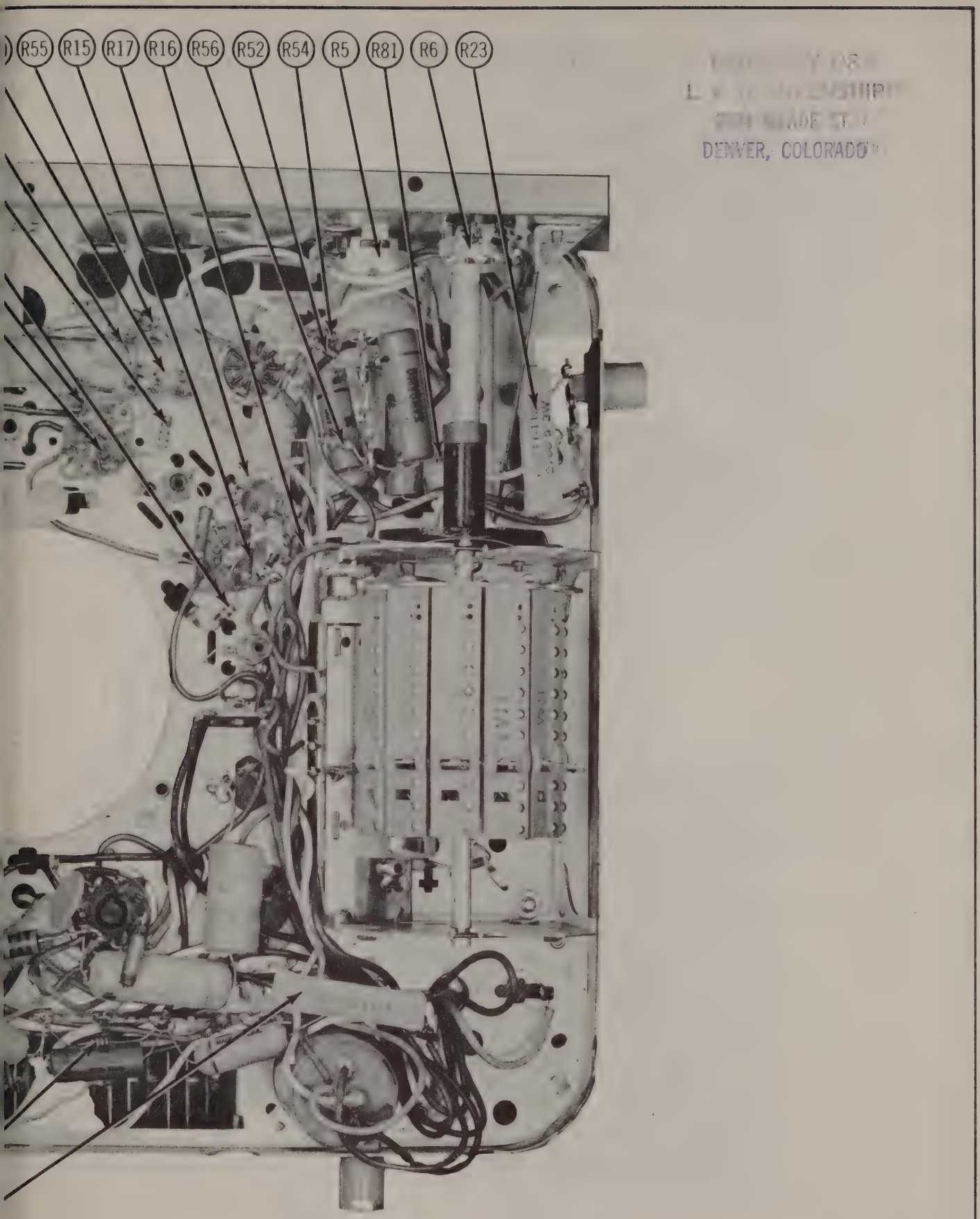
RESISTANCE MEASUREMENTS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V 1	6BC5	1Meg	0Ω	0Ω	. 1Ω	† 2. 5KΩ	† 4. 7KΩ	0Ω		
V 2	6J6	† 13KΩ	† 18KΩ	0Ω	. 1Ω	220KΩ	10KΩ	0Ω		
V 3	6CB6	1Meg	47Ω	0Ω	. 1Ω	† 3. 7KΩ	† 3. 7KΩ	0Ω		
V 4	6CB6	1Meg	62Ω	0Ω	. 1Ω	† 3. 7KΩ	† 3. 7KΩ	0Ω		
V 5	6AN8	4. 7KΩ	4. 7KΩ	.3Ω	. 1Ω	0Ω	† 3. 5KΩ	† 3. 5KΩ	2. 6Ω	82Ω
V 6	6AN8	† 70KΩ	2. 2Meg	0Ω	0Ω	. 1Ω	† 5. 6KΩ	† 2. 5KΩ	1Meg	160Ω
V 7	6AN8	† 8. 2KΩ	22KΩ	0Ω	0Ω	. 1Ω	† 33KΩ	† 33KΩ	470KΩ	47Ω
V 8	6BN6	300Ω	. 3Ω	0Ω	. 1Ω	† 18KΩ	5. 2Ω	† 220KΩ		
V 9	25BK5	† 420Ω	TP	70KΩ	♦ 11Ω	♦ 0Ω	150Ω	70KΩ	† 38Ω	TP
V 10	12BH7	▲ 4KΩ	2. 2Meg	1. 1KΩ	. 1Ω	. 1Ω	▲ 4. 5Meg	100KΩ	100KΩ	2. 5Ω
V 11	12AU7	† 50KΩ	320KΩ	0Ω	0Ω	0Ω	† 35KΩ	1. 5Meg	300KΩ	. 1Ω
V 12	25BQ6GT	TP	♦ 20Ω	TP	† 8. 2KΩ	470KΩ	TP	♦ 11Ω	0Ω	TOP CAP ▲ 13Ω
V 13	25AX4GT	TP	NC	200KΩ	NC	† 38Ω	TP	♦ 20Ω	♦ 27Ω	
V 14	1X2B		PINS	1 - 9	HAVE	INF	RESISTANCE			TOP CAP ▲ 253Ω
V 15	17HP4	0Ω	33KΩ	PIN 6 † 38Ω	PIN 10 † 38Ω	PIN 11 † 200KΩ	PIN 12 . 1Ω			

† MEASURED FROM OUTPUT OF M2.
▲ MEASURED FROM PIN 3 OF V13.
TP-TIE POINT.
NC-NO CONNECTION.
♦ MEASURED FROM PIN 5 OF V9.

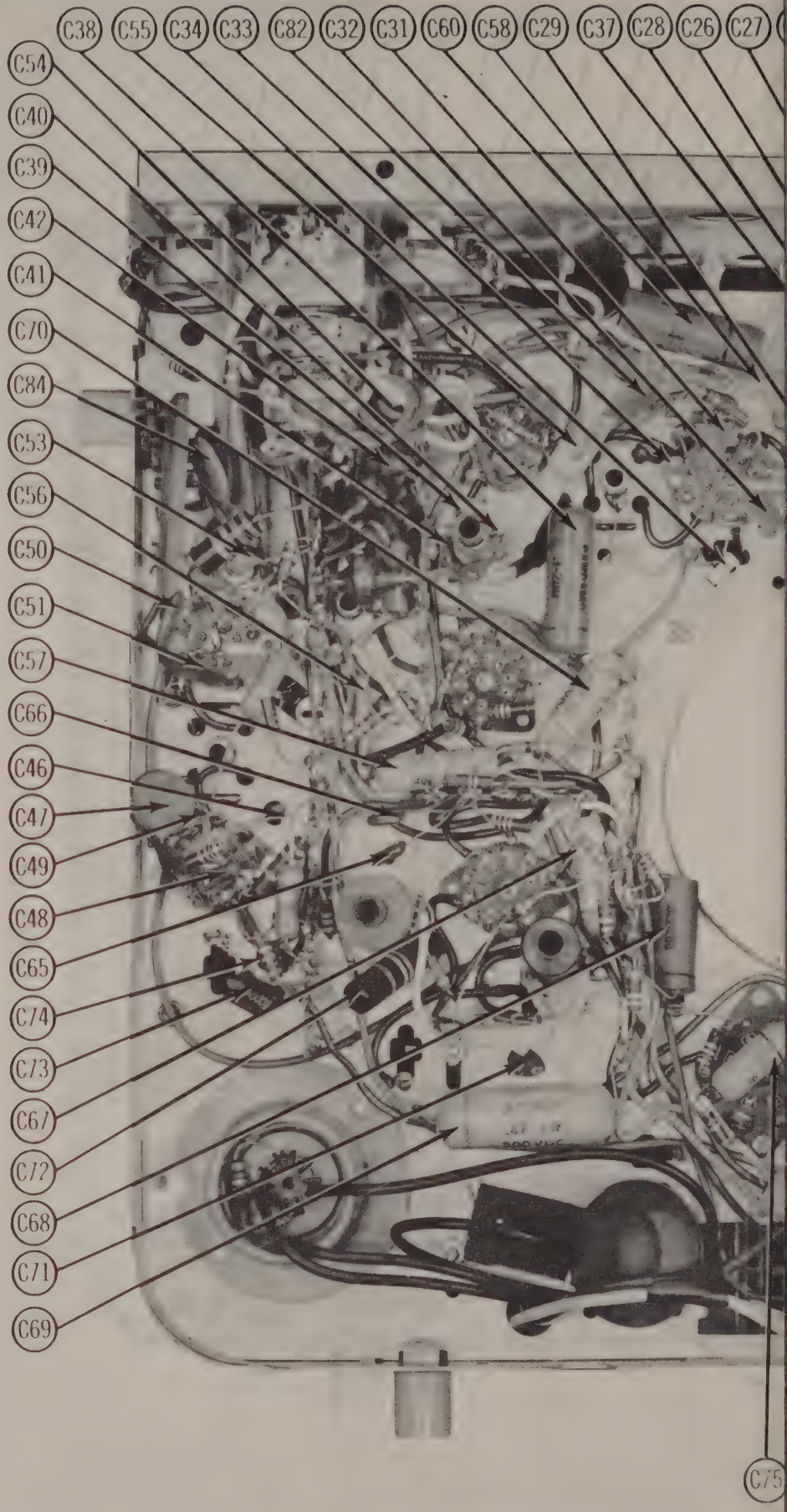


TUBE PLACEMENT CHART

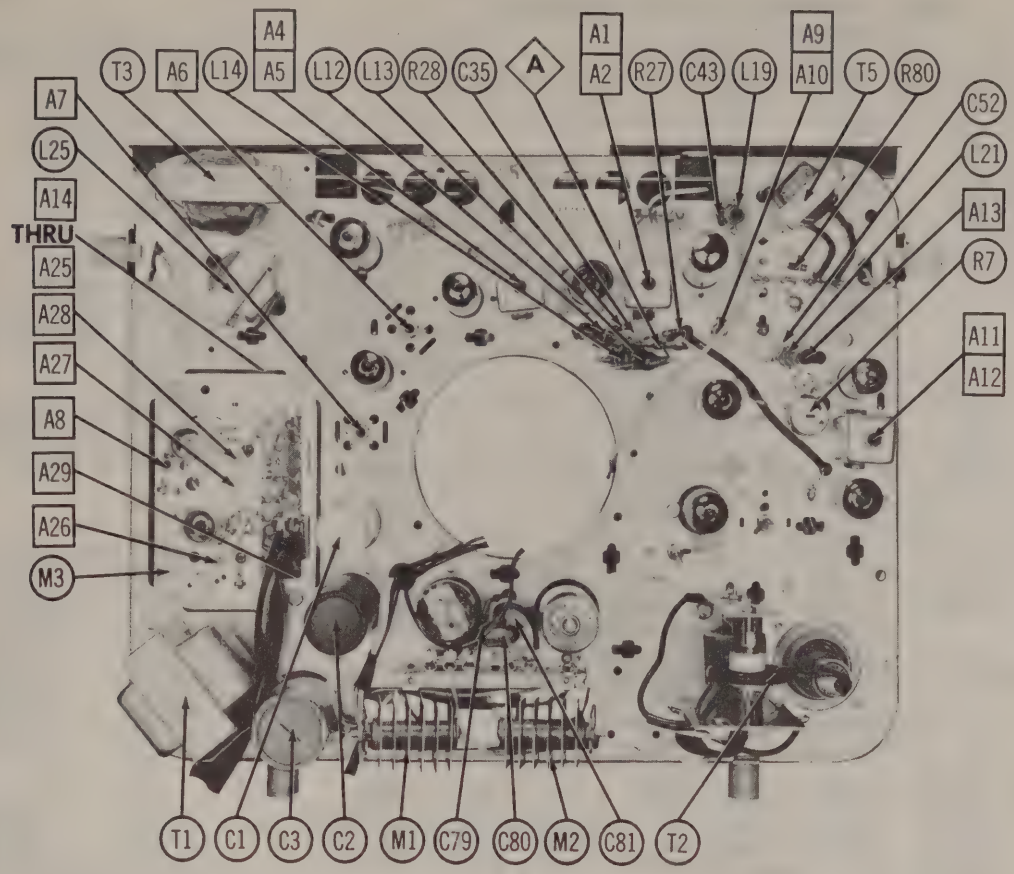


DENVER, COLORADO

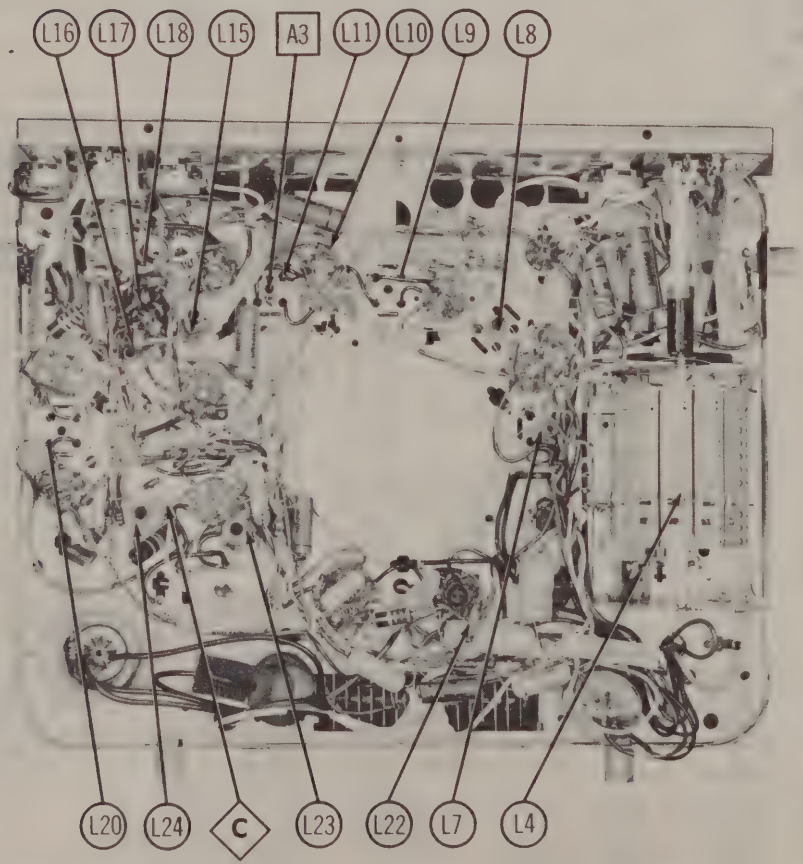
ESISTOR IDENTIFICATION



CHASSIS BOTTOM VI



CHASSIS TOP VIEW



CHASSIS BOTTOM VIEW-TRANS., INDUCTOR AND ALIGNMENT IDENTIFICATION

TUBES (GENERAL ELECTRIC, SYLVANIA)

ITEM No.	USE	REPLACEMENT DATA: TRUETONE PART No.	REPLACEMENT DATA: STANDARD REPLACEMENT	NOTES
V1	RF Amplifier	6BC5	6BC5	
V2	Mixer-Oscillator	6J6	6J6	
V3	1st. Video IF Amplifier	6CB6	6CB6	
V4	2nd. Video IF Amplifier	6CB6	6CB6	
V5	3rd. Video IF Amplifier-Video Detector	6AN8	6AN8	
V6	Video Output-Sync Sep.	6AN8	6AN8	
V7	Sound IF-Sync Amplifier	6AN8	6AN8	
V8	Audio Detector	6BN6	6BN6	
V9	Audio Output	25BK5	25BK5	
V10	Vert. Mult.-Vert. Output	12BH7	12BH7	
V11	Horiz. AFC-Horiz. Osc.	12AU7	12AU7	
V12	Horiz. Output	25BQ6GT	25BQ6GT	
V13	Damper	25AX4GT	25AX4GT	
V14	HV Rectifier	1X2B	1X2B	

CATHODE-RAY TUBE

ITEM No.	REPLACEMENT DATA: TRUETONE PART No.	REPLACEMENT DATA: CBS PART No.	REPLACEMENT DATA: GENERAL ELECTRIC PART No.	REPLACEMENT DATA: SYLVANIA PART No.	NOTES
V15	17HP4	17HP4/17RP4 17HP4B ①	17HP4/17RP4 17HP4B ①	17HP4/17RP4 17HP4B ②	① Aluminized ② Silver screen "85"

ELECTROLYTIC CAPACITORS

ITEM No.	RATING: CAP.	RATING: VOLT.	REPLACEMENT DATA: TRUETONE PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SANGAMO PART No.	SPRAGUE PART No.
C1	150	150	8C-22464	AFHS1-70	XA004	FP117	TM-150-150	T-050	TVL-3442
C2	150	150	8C-22463	AFHS1-70	XA004	FP117	TM-150-150	T-050	TVL-3442
C3A	100	300	8C-25309	RE-1019	D102	WQ635	TM-4128	T-620	R-2194
B	10	300			BR505			MT-0550	
C	25	450							
D	50	50							
C4	5	300	8C-24174	PRS350V4	BR435	TC60	TD-8-350	FM-3508	TVA-1601

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING: CAP.	RATING: VOLT	REPLACEMENT DATA: TRUETONE PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	NOTES
C5	1.5		13L8C1R5C	NP0-SI1.5	TCZ-1R5	Z004	NP0A-1R5	ZT-5515	5TCCB-V15	
C6	6.8		13L8C6R81	NP0-DI6.8	TCZ-6R8	Z013	NP0A-6R8	ZT-5568	5TCCB-V68	
C7	6.8		13L8C6R81	NP0-DI6.8	TCZ-6R8	Z013	NP0A-6R8	ZT-5568	5TCCB-V68	
C8	2-10		31B-901		829-10					
C9	800		13M-320EA-102ZC							
C10	.5-3		31B-902		829-3		3115-01-0R5	CT565A		
C11	800		13M-320EA-102ZC							
C12	800		13M-320EA-102ZC							
C13	.5-3		31B-902		829-3		3115-01-0R5	CT565A		
C14	60		13M-320Q-600J							
C15	10		13L8Q100A							
C16	10		13L8UA100D							
C17	8.2		13L8C8R2D	NP0-DI8.2		Z016	NP0A-8R2			
C18	120		13L8V121K	BPD-00012	DD-121	G044	811-121	UC-5312	5GA-T12	
C19	800		13M-320EA-102ZC							
C20	2.2			NP0-SI2.2	TCZ-2R2	TZ05	NP0A-2R2		5TCCB-V22	
C21	15			NP0-SI15	TCZ-15	TZ11	NP0K-150		5TCC-Q15	
C22	1000			BPD-001	DD-102	K069	801-001	DC-521	5HK-D1	
C23	2000			SI2000	D6-202	TP56	GP2L-102	UC-522	5HK-D2	
C24	1000			BPD-001	DD-102	K069	801-001	DC-521	5HK-D1	
C25	5			NP0-SI5	TCZ-4R7	TZ07	NP0A-050	ZT-555	5TCCB-V47	
C26	47			BPD-000047	DD-470	G033	831-470	UC-5447	5GA-Q47	
C27	1000			BPD-001	DD-102	K069	801-001	DC-521	5HK-D1	
C28	680			SI680	D6-681	TP50	GP2K-681	UC-5368	5GA-T68	
C29	5000			BPD-005	DD-502	K080	811-005	DC-525	5HK-D5	
C30	5000			BPD-005	DD-502	K080	811-005	DC-525	5HK-D5	
C31	5000			BPD-005	DD-502	K080	811-005	DC-525	5HK-D5	
C32	5000			BPD-005	DD-502	K080	811-005	DC-525	5HK-D5	
C33	1000			BPD-001	DD-102	K069	801-001	DC-521	5HK-D1	
C34	5			NP0-SI5	TCZ-4R7	TZ07	NP0A-050	ZT-555	5TCCB-V47	
C35	5			NP0-SI5	TCZ-4R7	TZ07	NP0A-050	ZT-555	5TCCB-V47	
C36	5000			BPD-005	DD-502	K080	811-005	DC-525	5HK-D5	
C37	.22	200		P288N-22		CUB2P22		PT4022	2TM-P22	
C38	.1	200		P288N-1	DF-104	CUB2P1		PT401	2TM-P1	
C39	51									
C40	3.3			NP0-SI3.3	TCZ-3R3	TZ06	NP0A-3R3	ZT-5533	5TCCB-V33	
C41	33			NP0-SI33	TCZ-33	TZ18	NP0L-330	ZT-5433	5TCC-Q33	
C42	.1	400		P488-1	DF-104	CUB4P1		PT401	4TM-P1	
C43	100			1469-0001	D6-101	5W5T1	811-101	MCB235	MS-31	
C44	.022	200		BPD-02	DD-203	CUB2S22	817-02	PT4122	2TM-S22	
C45	.022	600		BPD-02	DD-203	CUB2S22	817-02	PT6122	6TM-S22	
C46	30		14B-23772							Note 2
C47	10000			BPD-01	DD-103	K082	811-01	DC-511	5HK-S1	
C48	1000			SI1000	D6-102	TP32	GP2L-102	UC-521	5HK-D1	Note 1
C49	470			1469-00047	D6-471	5R5T47	811-471	MCB245	MS-347	
C50	10000			BPD-01	DD-103	K082	811-01	DC-511	5HK-S1	
C51	10000			BPD-01	DD-103	K082	811-01	DC-511	5HK-S1	
C52	10			NP0-SI10	TCZ-10	TZ09	NP0A-100	ZT-541	5TCC-Q1	
C53	1000			BPD-001	DD-102	K069	801-001	DC-521	5HK-D1	
C54	.01	400		BPD-01	D6-103	CUB4S1	GP3-333-103	PT411	4TM-S1	
C55	.01	600		BPD-01	D6-103	CUB6S1	GP3-333-103	PT611	6TM-S1	
C56A	270			SI270		TP41	GP2K-271	UC-5327	5GA-T27	
B	10000		†17A-24212	BPD-01	†PC-263	K082	811-01	DC-511	5HK-S1	
C	25			SI25		TP25	GP2K-250	UC-5425	5GA-Q25	
C57	.047	200		BPD-05	DF-503	CUB2S47		PT4147	2TM-S47	
C58A	2000							DC-522		
B	5000		•17A-22376	•PA-110	•PC-100	•115TM1	•1405-01	DC-525	•V-1	
C	5000							DC-525		
C59	2000			SI2000	D6-202	TP56	GP2-333-202	UC-522	5HK-D2	
C60	.1	200		P288N-1	DF-104	CUB2P1		PT401	2TM-P1	
C61	.033	400		BPD-03	DF-303	CUB6S33		PT6133	6TM-S33	
C62	.1	200		P288N-1	DF-104	CUB2P1		PT401	2TM-P1	
C63	.1	400		P488N-1	DF-104	CUB4P1		PT401	4TM-P1	
C64	1000	2000	8G-24991	HVD-30-001	DD30-102	V2D1	3KV-102	DC3021	20GA-D1	
C65	82			1469-000082	D6-820	5R5Q82	801-820		MS-482	

PARTS LIST A

CAPA

ITEM No.	RATING: CAP.	RATING: VOLT	TRUETONE PART No.	AEROVOX PART No.	CENTR PART
C66	82			1469-000082	D6-8
C67	.047	200		BPD-05	DF-5
C68	.022	200		BPD-02	DD-2
C69	.47	200		P288-47	
C70	.047	400		BPD-05	DF-5
C71	270			1469-00027	D6-2
C72	.01	600			
C73	1000			1464-001	
C74	82			1469-000082	D6-8
C75	.001	600		SI1000	D6-1
C76	.047	400		BPD-05	DF-5
C77	.1	600		P688N-1	DF-1
C78	.15	200		P288N-15	
C79	220	4000	8G-23953	HVD-60-22	DD6
C80	47	3000	8G-24026	HVD-30-47	DD3
C81	47	2000	8G-23645	HVD-30-47	DD3
C82	5000			BPD-005	DD-
C83A	5000			BPD-2X0047	DD2
B	5000				
C84	5000			BPD-005	DD-

Note 1. Not used in some versions.
Note 2. C46 is the capacity of the sound IF coupling shield
† Items C56A, C56B, C56C, R43A and R43B are combine
♦ Items C58A, C58B, C58C, R50A, R50B and R50C are c

CO

ITEM No.	RATING: RESISTANCE	RATING: WATTS	REPLACEMENT DATA: TRUETONE PART No.	CENTRALAB PART No.	CLARO PART
R1A	1000Ω	½	B10A-23714	F1-4	RTV-4
B	1Meg	½		R2-52	
C	Switch			KB-1	
R2A	50KΩ	½	B10B-23694	AB-31	A47-5
B	Shaft		Not Req.	AK-19	FKS-½
R3A	500KΩ	½	B10B-23695	AB-59	A47-5
B	Shaft		Not Req.	AK-4	KSS-3
R4A	150KΩ	½	B10B-23693-1	AB-43	A47-1
B	Shaft		Not Req.	AK-4	KSS-3
R5A	6000Ω with 1000Ω Stop	½	B10B-23407	♦ AB-10	♦ A47
B	Shaft		Not Req.	AK-1	FKS-½
R6A	3Meg	½	B10B-23696	AB-84	A47-3
B	Shaft		Not Req.	AK-1	FKS-½
R7	750Ω	2	A10D-23857		39-80

♦ Connect a 1000Ω resistor in series with the right hand te
terminal of the original control (control viewed from shaft
• Concentrikit Equivalent; K-6 Kit, Base Elements and Sh

† Universal Replacement (Mallory Exact Duplicate Part No

RES

ITEM No.	RATING: OHMS	RATING: WATT	REPLACEMENT DATA: TRUETONE PART No.	IRC PART No.	NOTE
R8	680KΩ	½		BTS-680K	
R9	4700Ω	½		BTS-4700	
R10	2200Ω	½		BTS-2200	
R11	220KΩ	½		BTS-220K	
R12	15KΩ	½		BTS-15K	
R13	10KΩ	½		BTS-10K	
R14	10KΩ	½		BTS-10K	
R15	5600Ω	½			
R16	1000Ω	½		BTS-1000	
R17	1000Ω	½		BTS-1000	
R18	47Ω	½		BTS-47	
R19	18KΩ	½			
R20	1000Ω	½		BTS-1000	
R21	1000Ω	½		BTS-1000	
R22	62Ω 5%	½		BTS-62 5%	
R23	2700Ω	3	9C11-1104		
R24	33KΩ	½			
R25	1000Ω	½		BTS-1000	
R26	82Ω	½		BTS-82	
R27	1Meg	½		BTS-1Meg	
R28	4700Ω	½		BTS-4700	
R29	1Meg	½		BTS-1Meg	
R30	5600Ω	2		BTB-5600	
R31	47Ω	½		BTS-47	
R32	100KΩ	½		BTS-100K	
R33	33KΩ	½		BTS-33K	
R34	470KΩ	1		BTS-470K	Note 1
R35	33KΩ	1		BTA-33K	
R36	47Ω	½		BTS-47	
R37	680Ω	½		BTS-680	
R38	220KΩ	½		BTS-220K	
R39	18KΩ	2		BTB-18K	
R40	22KΩ	½		BTS-22K	Note 2
R41	150Ω	1		BTA-150	
R42	10KΩ	½		BTS-10K	
R43A	220KΩ		† 17A-24212	BTS-220K	
B	2. 2Meg			BTS-2. 2Meg	
R44	100KΩ	½		BTS-100K	
R45	560KΩ	½		BTS-560K	

Note 1. Some versions use a 10
Note 2. Some versions use a 4
Note 3. Some versions use a 4
Note 4. Some versions use a 8
Note 5. Not used in some versi
† Items R43A, R43B, C56A, C
♦ Items R50A, R50B, R50C, C

PARTS LIST AND DESCRIPTIONS

TUBES (GENERAL ELECTRIC, SYLVANIA)

ITEM No.	USE	REPLACEMENT DATA: TRUETONE PART No.	STANDARD REPLACEMENT	NOTES
V1	RF Amplifier	6BC5	6BC5	
V2	Mixer-Oscillator	6J6	6J6	
V3	1st. Video IF Amplifier	6CB6	6CB6	
V4	2nd. Video IF Amplifier	6CB6	6CB6	
V5	3rd. Video IF Amplifier-Video Detector	6AN8	6AN8	
V6	Video Output-Sync Sep.	6AN8	6AN8	
V7	Sound IF-Sync Amplifier	6AN8	6AN8	
V8	Audio Detector	6BN8	6BN8	
V9	Audio Output	35B5	35B5	
V10	Vert. Mult.-Vert. Output	12BH7	12BH7	
V11	Horiz. AFC-Horiz. Osc.	12AU7	12AU7	
V12	Horiz. Output	25Q6GT	25Q6GT	
V13	Damper	35AX4GT	35AX4GT	
V14	HV Rectifier	1X2B	1X2B	

CATHODE-RAY TUBE

ITEM No.	REPLACEMENT DATA: TRUETONE PART No.	CBS PART No.	GENERAL ELECTRIC PART No.	SYLVANIA PART No.	NOTES
V15	17HP4	17HP4, 17HP4A	17HP4, 17HP4A	17HP4 ①	① Aluminized ② Silver screen "65"

ELECTROLYTIC CAPACITORS

ITEM No.	RATING: CAP.	VOLT	REPLACEMENT DATA: TRUETONE PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SANGAMO PART No.	SPRAGUE PART No.
C1	150	150	8C-23404	AFH51-70	XA004	FP17	TM-150-150	T-050	TVL-3442
C2	150	150	8C-23403	AFH51-70	XA004	FP17	TM-150-150	T-050	TVL-3443
C3A	100	300	8K-25309	RE-1019	DB00	WQ835	TM-4125	T-030	R-2184
B	10	300			BR505			MT-0550	
C	25	150							
D	50	50							
C4	5	300	8C-24174	PRS350V4	BR435	TC80	TD-8-350	FM-3506	TVA-1501

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING: CAP.	VOLT	REPLACEMENT DATA: TRUETONE PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	NOTES
C5	1.5		13L8C15R5C	MP0-4I1.5	TC2-1R5	Z004	NP0A-1R5	ZT-5515	5TCCB-V15	
C6	5.6		13L8C56R1	MP0-4I5.6	TC2-5R6	Z013	NP0A-5R6	ZT-5568	5TCCB-V56	
C7	5.6		13L8C56R1	MP0-4I5.6	TC2-5R6	Z013	NP0A-5R6	ZT-5568	5TCCB-V56	
C8	2-10		31B-901		S39-10					
C9	500		13M-330EA-1022C							
C10	.5-9		31B-902		S39-3		31B5-01-0R5	CT565A		
C11	500		13M-330EA-1022C							
C12	500		13M-330EA-1022C							
C13	.5-9		31B-902		S39-3		31B5-01-0R5	CT565A		
C14	60		13M-330Q-500J							
C15	10		13L8Q10GA							
C16	10		13L8UA100D							
C17	5.3		13L8C53R3	MP0-4I5.3		Z016	NP0A-5R3			
C18	120		13L8V121K	BPD-0002	DD-121	G044	611-121	UC-5313	5GA-T12	
C19	800		13M-330EA-1022C							
C20	3.3			MP0-4I3.3	TC2-3R3	TZ05	NP0A-3R3	ZT-5533	5TCCB-V33	
C21	15			MP0-4I15	TC2-15	TZ11	NP0K-150	ZT-5439	5TCC-Q15	
C22	1000			BPD-001	DD-102	K089	801-001	DC-521	5HK-D1	
C23	3000			B2000	DD-302	TP56	GP2L-102	UC-533	5HK-D3	
C24	1000			BPD-001	DD-102	K089	801-001	DC-521	5HK-D1	
C25	5			MP0-4I5	TC2-4R7	TZ07	NP0A-050	ZT-556	5TCCB-V47	
C26	47			MP0-4I47	TC2-4R7	TZ07	NP0A-470	ZT-5447	5GA-Q47	
C27	1000			BPD-001	DD-102	K089	801-001	DC-521	5HK-D1	
C28	680			B680	DM-681	TP50	GP5K-681	UC-5168	5GA-T68	
C29	5000			BPD-005	DD-502	K089	611-005	DC-525	5HK-D5	
C30	5000			BPD-005	DD-502	K089	611-005	DC-525	5HK-D5	
C31	5000			BPD-005	DD-502	K089	611-005	DC-525	5HK-D5	
C32	5000			BPD-005	DD-502	K089	611-005	DC-525	5HK-D5	
C33	1000			BPD-001	DD-102	K089	801-001	DC-521	5HK-D1	
C34	5			MP0-4I5	TC2-4R7	TZ07	NP0A-050	ZT-555	5TCCB-V47	
C35	5			MP0-4I5	TC2-4R7	TZ07	NP0A-050	ZT-555	5TCCB-V47	
C36	5000			BPD-005	DD-502	K089	611-005	DC-525	5HK-D5	
C37	.22	200		P288N-23		CUB2P23		PT4023	37M-P23	
C38	.1	300		P288N-1	DF-194	CUB4P1		PT401	37M-P1	
C39	.1									
C40	3.3			MP0-4I3.3	TC2-3R3	TZ06	NP0A-3R3	ZT-5533	5TCCB-V33	
C41	33			MP0-4I33	TC2-33	TZ18	NPOL-330	ZT-5433	5TCC-Q33	
C42	.1	600		P488-1	DF-104	CUB4P1		PT401	47M-P1	
C43	100	200		1460-0001	DS-101	5W5T1	611-101	MC3235	M5-31	
C44	.022	300		BPD-023	DD-303	CUB3S22	817-02	PT4123	37M-S23	
C45	.022	600		BPD-02	DD-303	CUB3S22	817-02	PT6123	67M-S23	
C46	30		14B-33772							Note 2
C47	10000			BPD-01	DD-103	K082	811-01	DC-511	5HK-E1	
C48	1000			B1000	D6-101	TP52	GP2L-102	UC-521	5HK-D1	Note 1
C49	470			1469-00047	DS-471	5W5T47	611-471	MS-347	M5-347	
C50	10000			BPD-01	DD-103	K082	811-01	DC-511	5HK-E1	
C51	10000			BPD-01	DD-103	K082	811-01	DC-511	5HK-E1	
C52	10			MP0-4I10	TC2-10	TZ09	NP0A-100	ZT-541	5TCC-Q1	
C53	1000			BPD-001	DD-102	K089	801-001	DC-521	5HK-D1	
C54	.01	600		BPD-01	DM-103	CUB6S1	GP5-333-103	PT611	67M-S1	
C55	.01	600		BPD-01	D6-103	CUB6S1	GP3-333-103	PT611	67M-S1	
C56A	270			B270		TP41	GP2E-271	UC-5327	5GA-T27	
B	10000		↑17A-24312	BPD-01	↑PC-203	K082	811-01	DC-511	5HK-E1	
C	25			B25		TP35	GP5K-250	UC-5425	5GA-Q25	
C57	.047	300		BPD-05	DF-503	CUB3S47		PT4147	37M-S47	
C58A	2000							DC-523		
B	5000		↑17A-23276	↑PA-110	↑PC-100	↑115TM1	↑4405-01	DC-524	↑V-1	
C	5000							DC-525		
C59	2000			B2000	D6-202	TP56	GP2-333-202	UC-523	5HK-D2	
C60	.1	300		P288N-1	DF-194	CUB3P1		PT401	37M-P1	
C61	.033	400		BPD-03	DF-303	CUB6S33		PT6133	67M-S33	
C62	.1	300		P288N-1	DF-104	CUB3P1		PT401	37M-P1	
C63	.1	150		P488N-1	DF-104	CUB4P1		PT401	47M-P1	
C64	1000	2000	SG-24991	HVD-30-001	DD30-102	V2D1	3KV-102	DC3031	20GA-D1	
C65	82			1469-0008S	D5-820	5R5Q82	801-820		M5-482	

CAPACITORS (cont)

ITEM No.	RATING: CAP.	VOLT	REPLACEMENT DATA: TRUETONE PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	NOTES
C66	82			1469-0008S	D6-820	5R5Q83	801-820		M5-482	
C67	.047	200		BPD-05	DF-503	CUB2S47		PT4147	27M-S47	
C68	.022	300		BPD-03	DD-303	CUB3S22	817-03	PT4122	37M-S22	
C69	.47	200		P288-47		CUB2P47		PT4047	27M-P47	
C70	.047	400		BPD-05	DF-503	CUB4S47		PT4147	47M-S47	
C71	270			1469-00027	D6-271	5W5T27	811-271	MC8241	M5-327	
C72	.01	600								
C73	1000			1464-001		IR5D1	811-102	MC8255	M5-21	
C74	82			1469-0008S2	D6-820	5R5Q83	801-820		M5-482	
C75	.001	600		S1000	D6-102	CUB6D1	GP2L-103	PT621	67M-D1	
C76	.047	400		BPD-05	DF-503	CUB4S47		PT4147	47M-S47	
C77	.1	600		P888N-1	DF-104	CUB6P1		PT601	67M-P1	
C78	.15	300		P288N-15		CUB3P15		PT4015	37M-P15	
C79	220	4000	SG-23953	HVD-60-22	DD60-221	V2T22	6KV-221	DC60322	30GA-T22	
C80	47	3000	SG-24036	HVD-30-47	DD30-470	V3Q47	3KV-470	DC30447	30GA-Q47	
C81	47	2000	SG-23645	HVD-30-47	DD30-470	V3Q47	3KV-470	DC30447	20GA-Q47	
C82	5000			BPD-005	DD-502	K060	811-005	DC-525	5HK-D5	
C83A	5000			BPD-5X0047	DD5-502	DK079	811-005	DC-525	5HK-D247	
B	5000						811-005	DC-525		
C84	5000			BPD-005	DD-502	K060	811-005	DC-525	5HK-D5	

Note 1. Not used in some versions.
Note 2. C46 is the capacity of the sound IF coupling shielded lead.
† Items C58A, C58B, C58C, R43A and R43B are combined in one unit.
‡ Items C58A, C58B, C58C, R50A, R50B and R50C are combined in one unit.

CONTROLS

ITEM No.	RATING: RESISTANCE	WATTS	REPLACEMENT DATA: TRUETONE PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	IRC PART No.	MALLORY PART No.	INSTALLATION NOTES
R1A	1000Ω	½	B10A-33714	Y1-4	RTY-488	*QJ-734	UF13L	Coolrast (Panel)
B	1Meg	½		R2-53			UH16A ↓ †	Volume (Rear)
C	Switch			KB-1			UB-28	Attach to R1B.
R2A	50kΩ	1	B10B-23694	AB-31	A47-50K-S	QJ1-133	TA50L	Horiz. Hold
B	Shaft		Not Req.	AE-19	FKS-½	TQ	Not Req.	Attach to R2A.
R3A	500kΩ	½	B10B-23695	AB-50	A47-500K-S	QJ1-133	TA50L	Brightness
B	Shaft		Not Req.	AE-4	KS6-3	Not Req.	Not Req.	Attach to R3A.
R4A	150kΩ	½	B10B-23693-1	AB-63	A47-150K-S	QJ1-338	TA194L	Vert. Hold
B	Shaft		Not Req.	AE-4	KS6-3	Not Req.	Not Req.	Attach to R4A.
R5A	800Ω	½	B10B-23407	▲AB-10	▲A47-500S-S	▲QJ1-L6	▲TA83L	Vert. Linearity
B	with 100Ω Stop							
B	Shaft		Not Req.	AK-1	FKS-½	BQ	Not Req.	Attach to R5A.
R6A	1Meg	½	B10B-23696	AB-94	A47-2Meg-S	QJ1-140	TA34L	Vert. Size
B	Shaft		Not Req.	AK-1	FKS-½	BQ	Not Req.	Attach to R6A.
R7	750Ω	3	A10D-23857	S2-800			BU55	

* Connect A (800Ω) resistor in series with the right hand terminal of the control and the lead connecting to the same terminal of the original control (control viewed from shaft end, terminals down).
* Concentrikit Equivalent; K-6 Kit, Base Elements and Shafts; ½ Kit, Shafts.

† Universal Replacement (Mallory Exact Duplicate Part No. UE650).

RESISTORS

ITEM No.	RATING: OHMS	WATT	REPLACEMENT DATA: TRUETONE PART No.	IRC PART No.	NOTES
R8	680Ω	½		BTS-680K	
R9	470Ω	½		BTS-470Ω	
R10	2200Ω	½		BTS-2200	
R11	220Ω	½		BTS-220K	
R12	15Ω	½		BTS-15K	
R13	10Ω	½		BTS-10K	
R14	10Ω	½		BTS-10K	
R15	560Ω	½			
R16	1000Ω	½		BTS-1000	
R17	1000Ω	½		BTS-1000	
R18	47Ω	½		BTS-47	
R19	18Ω	½			
R20	1000Ω	½		BTS-1000	
R21	1000Ω	½		BTS-1000	
R22	650 5%	½		BTS-63 5%	
R23	2700Ω	3	9C11-1D4		
R24	33kΩ	½			
R25	1000Ω	½		BTS-1000	
R26	82Ω	½		BTS-82	
R27	1Meg	½		BTS-1Meg	
R28	4700Ω	½		BTS-4700	
R29	1Meg	½		BTS-1Meg	
R30	5600Ω	2		BTS-5600	
R31	47Ω	½		BTS-47	
R32	100kΩ	½		BTS-100K	
R33	33kΩ	½		BTS-33K	
R34	470kΩ	½	Note 1	BTS-470K	
R35	33kΩ	½		BTS-33K	
R36	47Ω	½		BTS-47	
R37	68Ω	½		BTS-680	
R38	220kΩ	½		BTS-220K	
R39	18kΩ	½		BTS-18K	
R40	33kΩ	½	Note 2	BTS-33K	
R41	150Ω	1		BTA-150	
R42	10kΩ	½		BTS-10K	
R43A	220kΩ		↑ 17A-24213	BTS-220K	
B	2.2Meg			BTS-2.2Meg	
R44	100kΩ	½		BTS-100K	
R45	560kΩ	½		BTS-560K	
R46	22kΩ	½		BTS-22K	
R47	1Meg	½		BTS-1Meg	
R48	4700Ω	1		BTA-4700	
R49	1000Ω	½		BTS-1000	
R50A	22kΩ	½		BTS-22K	
B	820Ω	½	▲17A-22376	BTS-8200	
C	820Ω	½		BTS-8200	
R51	560Ω	½		BTS-100K	Note 3
R52	4700Ω	½		BTS-4700	
R53	68kΩ	½		BTS-68K	Note 4
R54	2.2Meg	½		BTS-2.2Meg	
R55	100kΩ	½		BTS-100K	
R56	3.3Meg	½		BTS-3.3Meg	
R57	3300Ω	5	9C13-1D5	PW7-3300	
R58	680Ω	½			
R59	560Ω	½			
R60	330kΩ	½			
R61	820kΩ	½		BTS-820K	
R62	220Ω	½			
R63	68kΩ	½			
R64	1900Ω	½			
R65	39kΩ	½			
R66	18kΩ	½			
R67	100kΩ	½		BTS-100K	
R68	68kΩ	½			
R69	33kΩ	½			
R70	68kΩ	½		BTS-68K	
R71	33kΩ	½		BTA-47K	
R72	4700Ω	½		BTS-4700	
R73	100Ω	½			
R74	470kΩ	½			
R75	6300Ω	2			
R76	1.5Ω	3		BW½-1.5	
R77	3500Ω	5	9C-24033	PW7-3500	
R78	153Ω	15	9C-23873		
R79	9Ω	3	49M-23018		
R80	470kΩ	½		BTS-470K	Note 5
R81	330kΩ	½		BTS-330K	
R82	470kΩ	½		BTS-470K	

Note 1. Some versions use a 100kΩ ½W resistor in this application.
Note 2. Some versions use a 47Ω ½W resistor in this application.
Note 3. Some versions use a 47kΩ ½W resistor in this application.
Note 4. Some versions use a 82kΩ ½W resistor in this application.
Note 5. Not used in some versions.
† Items R43A, R43B, C58A, C58B, C58C are combined in one unit.
‡ Items R50A, R50B, R50C, C58A, C58B, C58C are combined in one unit.

TRANSFORMER (FILAMENT)

ITEM No.	RATING: PRI.	SEC. 1	SEC. 2	SEC. 3	REPLACEMENT DATA: TRUETONE PART No.	Halldorson PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.
T1	115VAC	12VCT @ .30A	@ 2.1A		12D23699-3	PS516 ①	P2369	P6130	21F47	

① Drill new mounting holes.

TRANSFORMERS (SWEEP CIRCUITS)

ITEM No.	USE	REPLACEMENT DATA: TRUETONE PART No.	Halldorson PART No.	Merit PART No.	RCA TYPE No.	Ram PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.
T2	Horiz. Output Trans.	12E-23939	PS4577	HVO-58 ¾	X158 *	FLY-80 ¾	A-3123	FLY-80 ¾ D-71 *	
T3	Vert. Output Trans.	12E-23726-1	Z1804	A-3037	222T1	V313	A-3123	A-103X	
T4A	Yoke Horiz. (6.5MH)	20L-25586 ¼	DF601 ¾	MDY-70	206D1 ¾	Y170P6	DT-5A ¾	Y-5 ¾	YU-1 ¾
B	Vert. (45MH)	16M-24490 ¾	¾ C	¾ D	¾ D	¾ E	¾ F	¾ F	¾ F

L Includes resistors R58, R59.
Yoke rear cover and centering device.
Use original horizontal yoke damping network.
Requires new centering device.
Loosen and rotate core clamp to duplicate original mounting.

* HORIZONTAL OUTPUT TRANSFORMER CONNECTION DATA

Use Original Width Coil Unless Replacement Type Is Listed

ORIGINAL TERMINAL CONNECTIONS	Halldorson Replacement Connections	Merit Replacement Connections	RCA Replacement Connections	Ram Replacement Connections	Stancor Replacement Connections	Thordarson Replacement Connections	Triad Replacement Connections
8	8	8	8	8	8	8	8
6	6	6	6	6	6	6	6
3	3	3	3	3	3	3	3
2	2	2	2	2	2	2	2

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE: PRI.	SEC.	REPLACEMENT DATA: TRUETONE PART No.	Halldorson PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	NOTES
T5	6.4kΩ	3-4Ω	13C23704	21113	A3036	A3878	24S80	S-7X	

SPEAKER

ITEM No.	RATINGS: SIZE	FIELD	V C. IMP.	REPLACEMENT DATA: TRUETONE PART No.	QUAM PART No.	RCA TYPE No.	NOTES
SP1	4"	PM	3-4Ω	16A24681	4A07	22S81	

COILS (RF-IF)

ITEM No.	USE	DC RES.: PRI.	SEC.	REPLACEMENT DATA: TRUETONE PART No.	MEISSNER PART No.	MERIT PART No.	MILLER PART No.	NOTES
L1	Ant. Matching Trans.	0Ω	0Ω	1056-25235				
L3	Ant. Matching Trans.	0Ω	0Ω	1056-25235				
L3	IF Trap			1056-25281				
L4A	Ant., RF, Mixer Grid, Osc. Coils	0Ω		1056-25256-3				Channel 2
B	Ant., RF, Mixer Grid, Osc. Coils	0Ω		1056-25256-3				Channel 3
C	Ant., RF, Mixer Grid, Osc. Coils	0Ω		1056-25256-4				Channel 4
D	Ant., RF, Mixer Grid, Osc. Coils	0Ω		1056-25256-5				Channel 5
E	Ant., RF, Mixer Grid, Osc. Coils	0Ω		1056-25256-6				Channel 6
F	Ant., RF, Mixer Grid, Osc. Coils	0Ω		1056-25256-7				Channel 7
G	Ant., RF, Mixer Grid, Osc. Coils	0Ω		1056-25256-8				Channel 8
H	Ant., RF, Mixer Grid, Osc. Coils	0Ω		1056-25256-9				Channel 9
I	Ant., RF, Mixer Grid, Osc. Coils	0Ω		1056-25256-10				Channel 10
J	Ant., RF, Mixer Grid, Osc. Coils	0Ω		1056-25256-11				Channel 11
K	Ant., RF, Mixer Grid, Osc. Coils	0Ω		1056-25256-12				Channel 12
L	Ant., RF, Mixer Grid, Osc. Coils	0Ω		1056-25256-13				Channel 13
L5	RF Coil	0Ω		1056-25237				
L6	1st Video IF	.9Ω		1056-25238				
L7	2&3SMC Trap	.1Ω		13M-25586				
L8	2nd Video IF	.2Ω		201-23829				
L9	3rd Video IF			201-24043				Includes resistors & caps.
L10	RF Choke	3.6Ω		19-2036	19-2036	TV-180	6178	35.2 Microhenries
L11	4th Video IF	.3Ω	.3Ω	13D-23687				
L12	Series Peaking Coil	3.6Ω		16A-23233	19-6032		6153	32 Microhenries
L13	Series Peaking Coil	3.6Ω		16A-23233	19-6032		6153	32 Microhenries
L14	Shunt Peaking Coil	23Ω		16A-18565	19-6400		6174	410 Microhenries
L15A	4.5MC Trap	1.5Ω		201-23729				
B	1st Sound IF	3.1Ω						
L16	Series Peaking Coil	8.7Ω		16A-21291	19-3300		6155	305 Microhenries
L17	Shunt Peaking Coil	7.8Ω		16A-20970	19-3280	TV-185	6130	270 Microhenries
L18	Series Peaking Coil	2.6Ω		16A-24090	19-1005		6423	11 Microhenries

PARTS LIST AND DESCRIPTIONS (Continued)

COILS (cont)

ITEM No.	USE	DC RES. PRI.	DC RES. SEC.	REPLACEMENT DATA TRUETONE PART No.	MEISSNER PART No.	MERIT PART No.	MILLER PART No.	NOTES
L19	4.5MC Trap	1Ω		201-24749	20-1004	TV-151	1469	
L20	2nd Sound IF	.3Ω	.3Ω	201-23873	17-3495 *	TV-113 *	6203 *	
L21	Quadrature Coil	5.2Ω		201-23727	20-1005		1480	
L22	RF Choke	1.6Ω						8 Microhenries

* Cut out chassis hole and use adaptor plate.

TRANSFORMER (HORIZ. OSC.)

ITEM No.	DC RES. PRI.	DC RES. SEC.	REPLACEMENT DATA TRUETONE PART No.	MEISSNER PART No.	MERIT PART No.	MILLER PART No.	RCA TYPE No.	Ram PART No.	Thordarson PART No.	NOTES
L23	80Ω		12E-24440			6212				Tapped @ 58Ω Horiz. Osc.
L24	38Ω		13M-24441			6314				Horiz. Phase

FILTER CHOKE

ITEM No.	RATINGS TOTAL DIRECT CURRENT	RATINGS D. C. RESISTANCE	RATINGS INDUCTANCE (0 CURRENT 1000 ~)	REPLACEMENT DATA TRUETONE PART No.	Halldorson PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.
L25	.250A	37.5Ω	.5HY	16A-23889-1	C5040	C2994	C2327	26C41	C-23X ①

① Drill one new mounting hole.

SELENIUM RECTIFIER

ITEM No.	RATING CURRENT	REPLACEMENT DATA TRUETONE PART No.	FEDERAL PART No.	INTERNATIONAL PART No.	MALLORY PART No.	RADIO RECEPTOR PART No.	SARKES TARZIAN PART No.	NOTES
M1	.250A	21J23840	1236A	MR300	6S300	6Q4	250	
M2	.250A	21J23840	1236A	MR300	6S300	6Q4	250	

MISCELLANEOUS

ITEM No.	PART NAME	TRUETONE PART No.	NOTES
M3	Tuner	211-25514-1	VHF
M4	Centering Device	16M-24493	Includes Deflection Yoke (T4) Rear Cover
M5	Ion Trap	16M-19705	
	Cabinet	200-25557	
	Knob	5B-23806-A29	Channel Selector
	Knob	5B-23807-A29	Fine Tuning
	Knob	5B-23808-A29	Picture
	Knob	5B-23809-A29	On-off-volume
	Knob	5B-23839-A29	Control (3 used)

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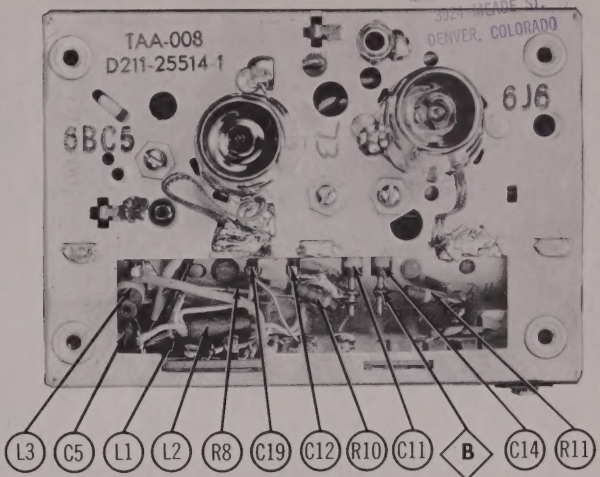
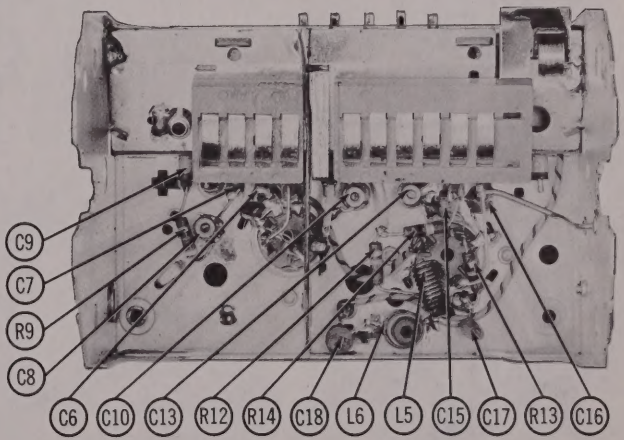
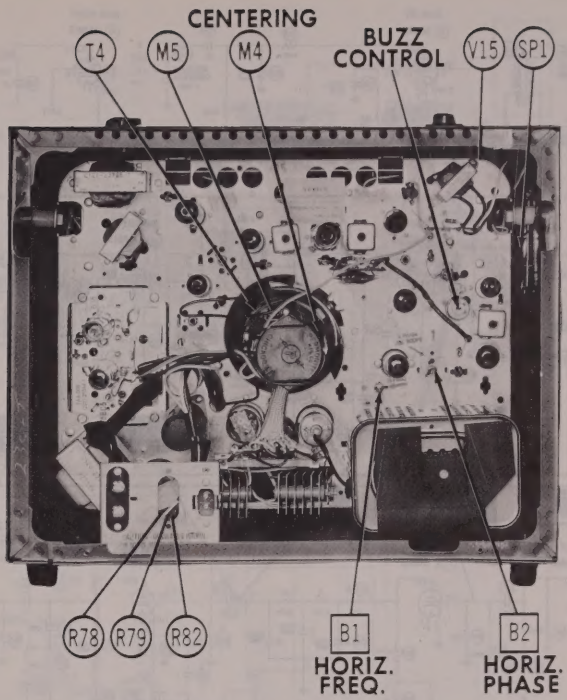
DENVER, COLORADO



RF TUNER-TOP VIEW



RF TUNER-BOTTOM VIEW



CABINET—REAR VIEW

HORIZONTAL SWEEP CIRCUIT ADJUSTMENTS

Turn the set on and tune in a TV station, preferably with a test pattern.

Turn the horizontal hold control (R2) to its mid-range position.

Connect a short clip lead across L24. Adjust the horizontal frequency slug (B1) until the picture synchronizes horizontally. Remove the clip lead from L24. Connect the vertical lead of the oscilloscope thru a low capacity probe to point Ⓒ. Low side to chassis. Adjust the horizontal stabilizer coil (B2) until a waveform similar to Fig. 5 is obtained. While making this adjustment, keep the picture in sync with the horizontal hold control. Check the range of the horizontal hold control (R2). Turn R2 fully counter clockwise, then back clockwise. The picture should fall out of sync at each extreme setting of the control.

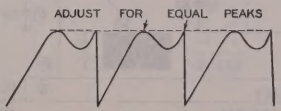
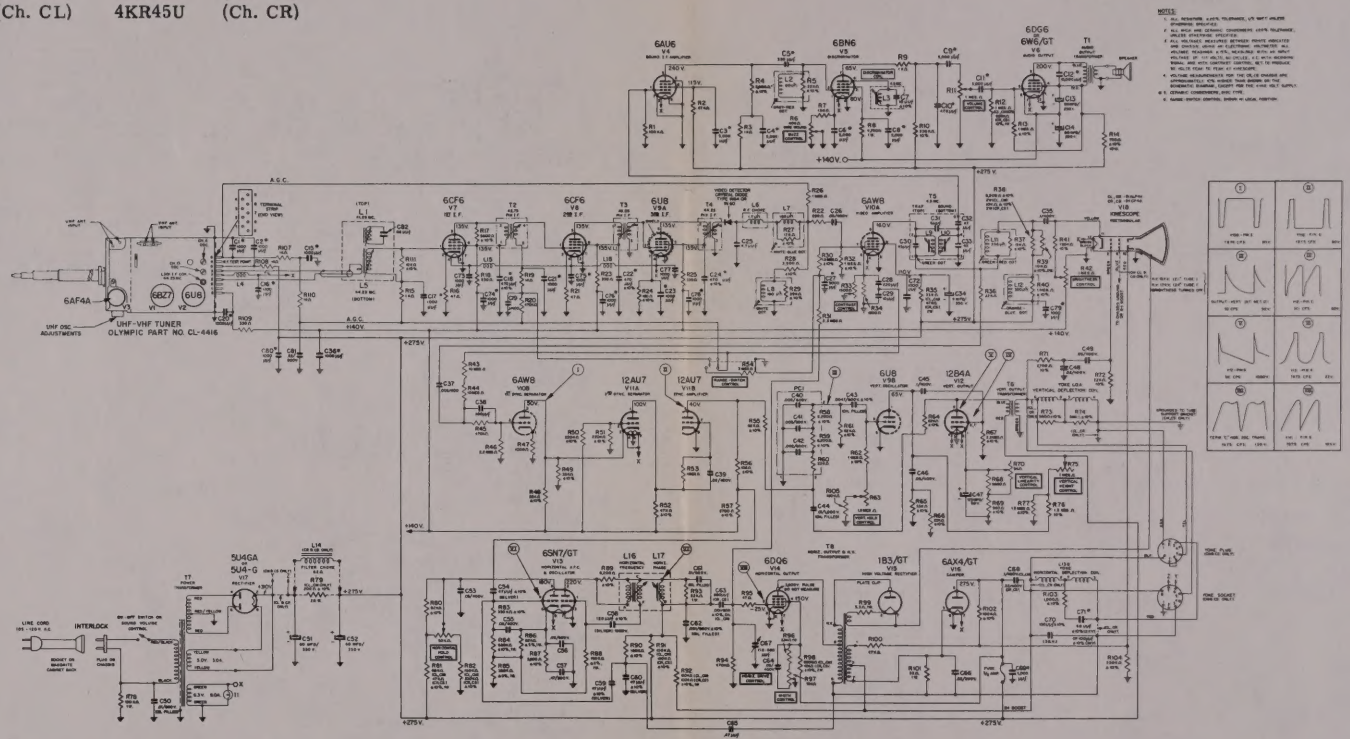


FIG. 5

OLYMPIC MODELS

1CL22U	(Ch. CL)	1TM13U	(Ch. CM)
1CL23U	(Ch. CL)	4CR26U	(Ch. CR)
1CM24U	(Ch. CM)	4CR27U	(Ch. CR)
1CM25U	(Ch. CM)	4CS28U	(Ch. CS)
1KL41U	(Ch. CL)	4CS29U	(Ch. CS)
1KL42U	(Ch. CL)	4KR44U	(Ch. CR)
1KL43U	(Ch. CL)	4KR45U	(Ch. CR)

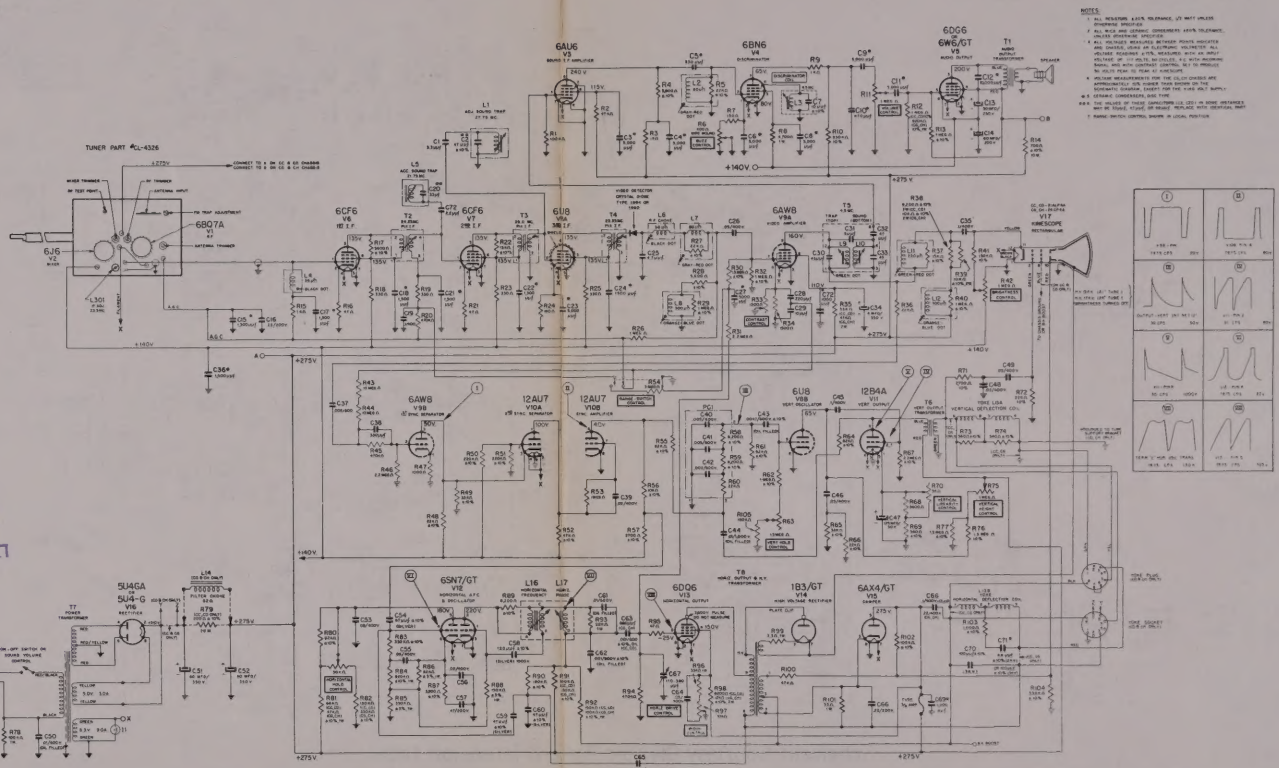


Schematic Courtesy Olympic Radio & Television Inc.

OLYMPIC

OLYMPIC MODELS

1CC22	(Ch. CC)	1TD13	(Ch. CD)
1CC23	(Ch. CC)	4CG26	(Ch. CG)
1CD24	(Ch. CD)	4CG27	(Ch. CG)
1CD25	(Ch. CD)	4CH28	(Ch. CH)
1KC41	(Ch. CC)	4CH29	(Ch. CH)
1KC42	(Ch. CC)	4KG44	(Ch. CG)
1KC43	(Ch. CC)	4KG45	(Ch. CG)
1TC12	(Ch. CC)		



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